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Vol. III

TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1934

No. 254

PARAMOUNT PUBLIX CORPORATION,
PETITIONER,

vs.

AMERICAN TRI-ERGON CORPORATION

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT

PETITION FOR CERTIORARI FILED AUGUST 6, 1934.

CERTIORARI GRANTED NOVEMBER 5, 1934.

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FORM NO. 1308 BULLETIN No. 135, May 6, 1908.

THE MUSIC MASTER

A Most Beautiful Motion Picture Fantasy

LENGTH, 500 FEET. PRICE, 14 CENTS PER FOOT

What is more miserable than a love blighted life? for the heart that truly loves can never forget. Such is the sad fate of the hero of this Biograph story. Herr Von Mitzel, a disciple of Antonio Stradivari, fell deeply in love with his pupil, the daughter of a wealthy English Lord. His love was returned by the fair young maid, who grieved at the disparity of their rank, and wished that he had been more highly born or she more lowly. Oh, the tyranny of fate. What discouraging conditions were brought to bear upon their affections, but true love can no more be diminished by showers of evil-hap than flowers are marred by timely rains; so the conspiring circumstances tended rather to strengthen than to weaken their passion.

Now, in the winter of his existence we find Von Mitzel alone and forlorn. His only companion and solace is his faithful violin, the strains of which are more eloquent than melodious, conjuring up as they do, the recollections of life's spring-time. We picture him seated at his cheerless fireside playing his, or rather her favorite selection, and as the sweet tones float out upon the silent night, there appears on the wall a phantasmagorial portrayal of his thoughts, which bring him back to days of yore. The image of his inamorata is first seen; then the lesson on the harpsichord, when he declares his love, next the scene of her being forced by her parents into an odious marriage compact, then a duel with his rival in which he is wounded. This scene dissolves into the reappearance of the girl.

The subject is most beautiful and touching, and is sure to win the sympathetic approval of the spectator, besides being a work of photographic excellence.

No. 3403 **CODE WORD—Revelry**

Produced and Controlled Exclusively by the

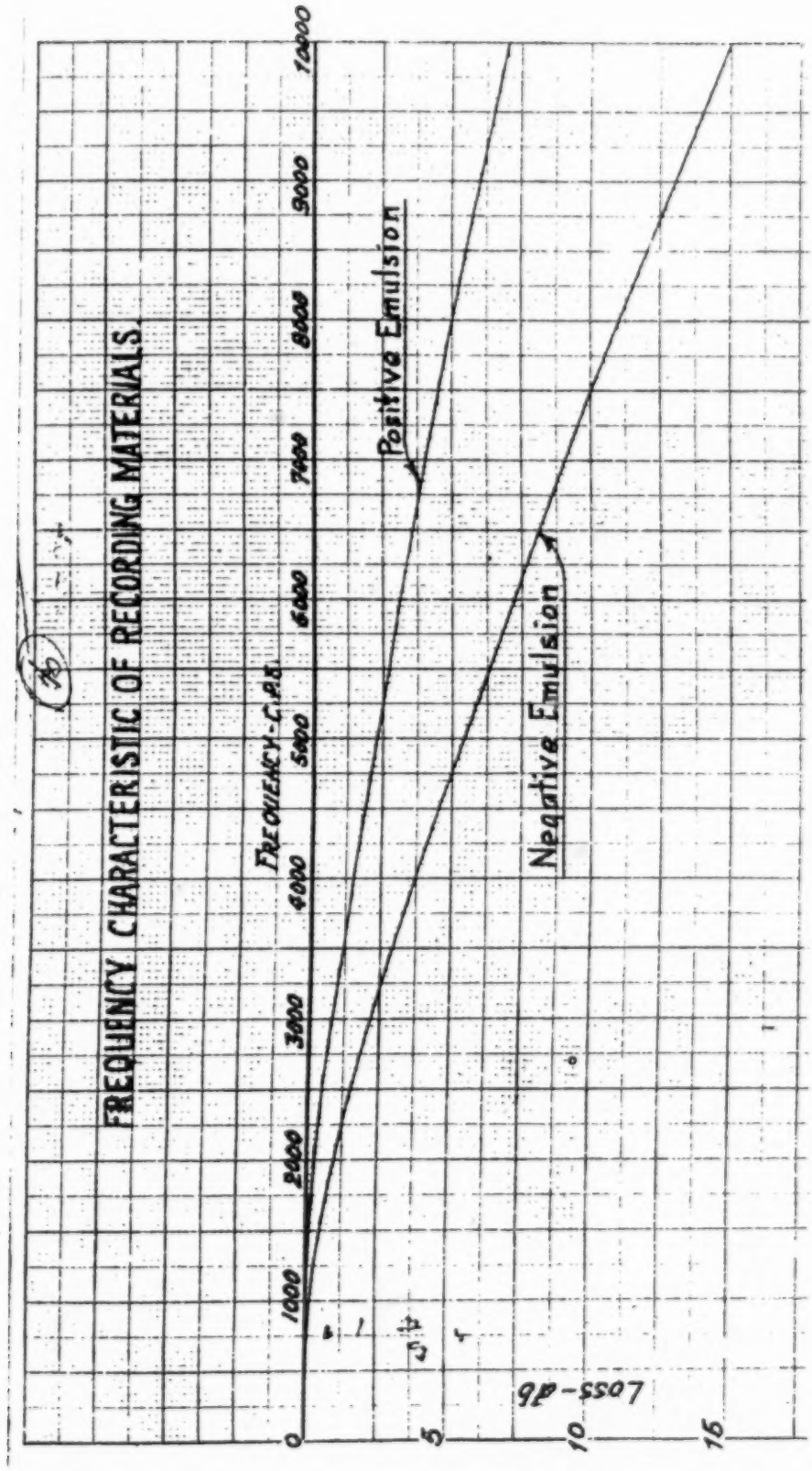
American Mutoscope & Biograph Co.

East 14th Street, New York City

PACIFIC COAST BRANCH, 116 North Broadway, Los Angeles Cal.

Licensees { Williams, Brown & Earle. Kleine Optical Company.
Society Italian "Cines" Great Northern Film Company.
American Mutoscope & Biograph Company.

DEFENDANT'S EXHIBIT F



DANIEL BENLANN & DAVID BENDANN.

Improvement in Photographic Backgrounds.

No. 124,522 Patented April 9, 1872.

Fig. 2

Fig. 4

Fig 3

Fig. 1

Witnesses:

Everett J Haydon

Chas A Lossen

Inventors:

Daniel Benidann

David Bendann

123,522

UNITED STATES PATENT OFFICE.

DANIEL BENDANN AND DAVID BENDANN, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN PHOTOGRAPHIC BACKGROUNDS.

Specification forming part of Letters Patent No. 123,522, dated April 9, 1872.

Specifications describing an improved process of preparing photographic background studies and negatives thereof, and of printing backgrounds upon photographs and photographic prints, invented by DANIEL BENDANN and DAVID BENDANN, both of the city of Baltimore, State of Maryland.

The preparation of backgrounds for photographs and photographic prints being usually attended with great expense on account of the number and size of paintings required, and the artistic skill necessary for their production, and the best results obtained being so meager, unsatisfactory, and unartistic, the obtaining of suitable backgrounds at a reduced expense, and free from the defects alluded to has been a great desideratum in photography, and this object we accomplish in the following manner:

Figure 1 is a given landscape. Fig. 2 is a plain photograph. Fig. 3 is a rough mask. Fig. 4 is a photograph with landscape printed in.

A landscape, Fig. 1, or other subject desired for the given background is delineated upon canvas or other material, in such a manner as to secure graduated lights and shades that will produce required atmospheric and scenic effects in the backgrounds of photographs, made by the process hereinafter explained, which is mainly accomplished by making the high lights lighter and the dark shades darker. The size of the picture thus delineated is immaterial, and it may be made of any dimensions to suit the convenience of the artist. A negative of this picture is then taken with the common photographic camera, and with this negative the background of the photograph is made in the manner hereinafter specified.

It is obvious that any required number of negatives may be made of the picture thus delineated, and as these negatives can be furnished at a trifling cost, obviating the necessity of procuring expensive paintings for desired backgrounds, the great commercial value of this part of our invention is apparent.

When backgrounds are desired for photographs of persons or other objects in nature, the negative of the object is made with the common photographic camera in the usual mode, and the photograph of this object is then printed in the common way with the customary dove-colored, dark gray, or other desired plain background, it not being necessary to shade off either the object delineated, or the plain background; and after the picture, Fig. 2, is printed ready for toning, the negative is removed, and the background negative is suitably adjusted over the print, Fig. 2, just made; a cloth, the hand, or a mask, Fig. 3, roughly shaped in the form of the printed object in Fig. 2, being placed over the background negative directly above the object, to prevent the rays of light falling upon the object, except at the pleasure of the artist; and the background (*b b* in Fig. 4) is then printed upon the photograph, the artist manipulating this cloth or or mask, Fig. 3, so as to harmoniously blend the background with the outlines of the object (*a* in Fig. 4) already printed; and when the background has been printed to the desired point, the completed photograph, Fig. 4, is toned in the ordinary manner.

This process is especially valuable for printing upon gelatine or other substances for photo-lithographic purposes and for tinted or colored photographs, as much labor and great expense are saved thereby; and it is also desirable in making backgrounds for old photographs or photographs of sculpture, old paintings, engravings, and other pictures.

When a given background is required for a photograph that already has a scenic background, the old background may be painted out or otherwise stopped out, (although this is not essential,) so that it will print white, and then the desired shade can be printed in either before or after the given background is made in the manner heretofore described.

It is apparent that a desired background may in like manner be printed upon a vignetted photograph that will harmonize with the vignette. It is also obvious that with one negative of the sitter or main object photographed any number of prints may be made, all having different backgrounds, the number and variety being only limited by the number of background negatives in possession of the photographer.

The ease and celerity with which the art of printing in backgrounds by the process just described, may be acquired makes our invention especially advantageous to the public, and it will be found that the following among other

objects greatly desired, but never before obtained, have been thereby secured, namely: The background is rendered entirely subordinate to the main object photographed. There are no sharp outlines between this main object (*a* in Fig. 4) and the background, (*b b* in Fig. 4,) but the whole photograph is harmonious in tone and shade.

Scenic and atmospheric effects are produced that hitherto it has been impossible to obtain, and the minutest details, even in the outlines of the main object, (*a* in Fig. 4,) photographed, such as floating hairs or the finest-meshed lace, are accurately preserved and faithfully delineated.

We claim as our invention—

1. The delineation, upon canvas or other material, of the desired objects in nature or of art, in such a manner as to secure graduated lights and shades that will produce required atmospheric and scenic effects in the backgrounds of photographs and photographic prints, in the manner described.

2. The printing of backgrounds in photographs and photographic prints, by the use of properly-prepared background negatives without the necessity of painting out or otherwise stopping out original backgrounds, in the manner described.

DANIEL BENDANN.
DAVID BENDANN.

Witnesses:
WM. H. MCCABE,
WM. H. BAYZAND.

No. 606,993. Patented July 5, 1898.

C. F. JENKINS.

DEVICE FOR OBTAINING STEREOSCOPIC EFFECTS IN EXHIBITING PICTURES.

(Application filed June 19, 1897.)

No Model.)

Fig. 1.

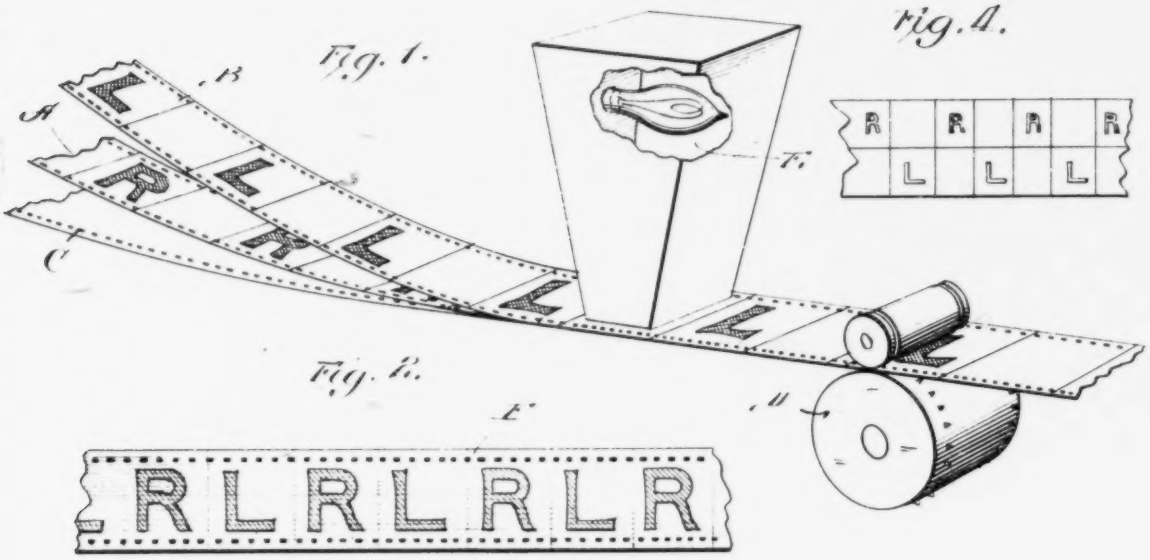
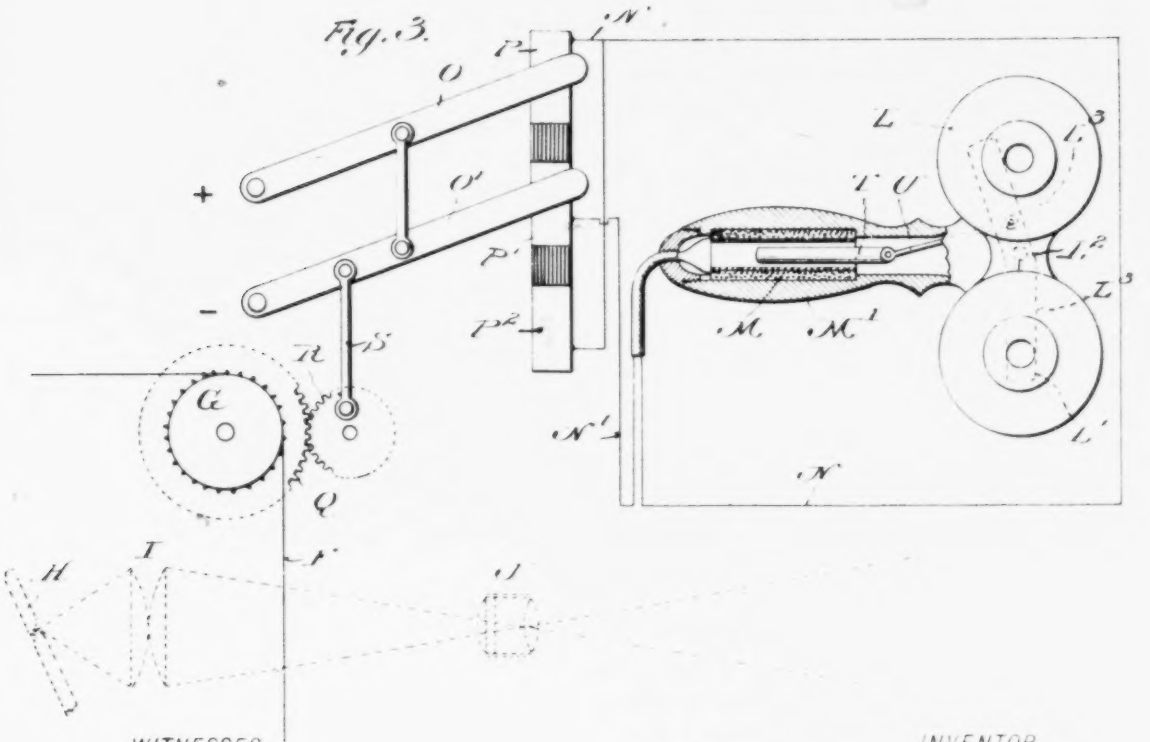


Fig. 4.

Fig. 2.

Fig. 3.



WITNESSES

Henry S. Potter.

Edwin G. Yeabower.

INVENTOR

Charles Francis Jenkins

BY

Miles & Bruce,

ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES FRANCIS JENKINS, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO EMILE BERLINER, OF SAME PLACE.

DEVICE FOR OBTAINING STEREOSCOPIC EFFECTS IN EXHIBITING PICTURES.

SPECIFICATION forming part of Letters Patent No. 606,993, dated July 5, 1898.

Application filed June 19, 1897. Serial No. 641,455. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FRANCIS JENKINS, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Devices for Obtaining Stereoscopic Effects in Exhibiting Pictures; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide means whereby the observer in looking at series pictures showing objects in motion may see the objects in such relief as is given by a stereoscope. For illustration I have selected devices that permit pictures thrown upon a screen to be so seen simultaneously by each individual of an assembly; but many other embodiments of the invention are obviously possible.

A common stereoscope uses a pair of pictures showing the object as seen from two points whose separation is approximately equal to that of the right and left eyes, and pictures analogous to the pictures of such a pair are herein designated as "right" pictures and "left" pictures. Apparatus in accordance with this invention exhibits to the right eye in rapid succession a series of right pictures of a moving object and during such exhibition exhibits to the left eye an approximately corresponding series of left pictures, whereby the object is perceived in relief and in motion. The two sets of pictures may be made up of pairs of synchronously-taken right and left pictures, and these may be simultaneously exhibited to the right and left eyes, respectively. Neither condition is indispensable, however, and with the apparatus illustrated the impressions upon the two retinas are made alternately. Preferably the two series of pictures are combined upon an ordinary strip or film, and under ordinary inspection neither the strip nor the pictures when projected are noticeably different from the ordinary film and pictures, although this film bears alternating right and left pictures; but if the projected pictures be viewed with the aid of devices that allow only the right-eye pictures to be seen by the right eye and the left-eye pictures by the left eye the moving object is seen in full stereoscopic relief.

In the drawings, Figure 1 shows the means for obtaining a strip having in the same line alternating right and left pictures. Fig. 2 shows a portion of such strip. Fig. 3 is a partly-diagrammatic plan showing the projecting devices, the observing devices, and the connections whereby movements of the first cause synchronous movements in the second. Fig. 4 shows a modified strip.

In Fig. 1, A and B are film-strips bearing only right pictures and left pictures, respectively, and each having its pictures approximately a picture's width apart. These strips are so superposed that the pictures of each register with the spaces between the pictures of the other, and the three are then fed forward, preferably by a sprocket-drum D, whose teeth engage in registering perforations in the three beneath a beam of light at E, and thus both sets are printed upon the third strip, which, being properly developed, becomes the strip F ready for use. The strip F is placed in a suitable projecting apparatus, which may consist of a drum G for feeding the strip, a source of light H, a condenser I, a projecting lens J, and suitable devices (not shown) for operating the drum and insuring the placing of successive pictures accurately in the projecting beam of light at exactly the proper intervals. The projected pictures may be viewed through an opera-glass L or any binocular eyepiece adapted for supporting devices for alternately interrupting the lines of vision from the two eyes. As shown, the device L is provided with a shutter L′, pivoted at L^2 and limited in movement by stops L^3. The shutter is swung back and forth on its pivot synchronously with the advance of the pictures into the path of the beam of projecting light in such manner that while a left picture is on the screen the view by the right eye is cut off, and vice versa. To accomplish this result, a solenoid M is mounted in the handle M′ of the opera-glass and connected with any convenient source of current by wires N N′ and a simple current-reversing device. This is shown as consisting of two pivoted conducting-bars O O′, insulated from each other, but connected to swing together over conducting-

blocks P P' P², of which the first and last are connected with the wire N, while the other is connected with the wire N'. By means of a gear Q, moving with the drum G, a meshing pinion R, and a link S the drum in rotating so far as to advance the strip a picture's width swings both the bars O O' from the blocks upon which they rest, respectively, to the adjacent blocks, and thus reverses the current in the solenoid. Such reversal either draws inward or pushes outward a magnetized steel core T, connected by a link U to the shutter, and thereby swings the latter out of the line of sight of one eye and into the line of sight of the other. If then the view of the right eye, for example, be unobstructed and if the film be so placed that a right picture is projected, thereafter the whole series of pictures will be exhibited synchronously with the changes of the shutter, and the right and left eyes will see only right and left pictures, respectively, until the whole series has passed through the projecting beam.

Obviously the number of devices L is unlimited, and the conducting-wires merely replace the usual chain by which coin-freed opera-glasses are ordinarily secured to opera-chairs in public halls.

It is also plain that the construction may be widely varied within the limits of my invention, and I do not therefore wish to confine myself to the specific forms set forth. For example, I have shown in Fig. 4 the spaced left pictures alined alongside the spaced right pictures and upon the same strip, this being a form usable with an easily-made modification of the other devices shown.

What I claim is—

1. A series-picture strip bearing alternating right and left pictures of the same object.

2. A series-picture strip bearing in alinement alternating right and left stereoscopic pictures.

3. The method of printing a series-stereoscopic-picture strip by superposing right and left stereoscopic series negatives upon a sensitive blank strip in position to print both series in alternating succession upon said blank.

4. A series-stereoscopic-picture negative on which alined pictures all adapted to be viewed by the same eye alternate with blank spaces in width approximately equal to said pictures.

5. The combination with projecting devices, of means for advancing a series-picture strip therefor, a binocular eyepiece, a shutter adapted to alternately obstruct the lines of sight through said eyepiece, a solenoid arranged to actuate said shutter, conductors leading from said mechanism to said solenoid, and means whereby the movements of said mechanism control the current in said conductors.

In testimony whereof I affix my signature in presence of two witnesses.

C. FRANCIS JENKINS.

Witnesses:
HUGH M. STERLING,
WALLACE GREENE.

J. L. WALKER.

VOICE RECORDING AND REPRODUCING DEVICE.

APPLICATION FILED SEPT. 2, 1913.

1,186,717.

Patented June 13, 1916.

5 SHEETS—SHEET 1.

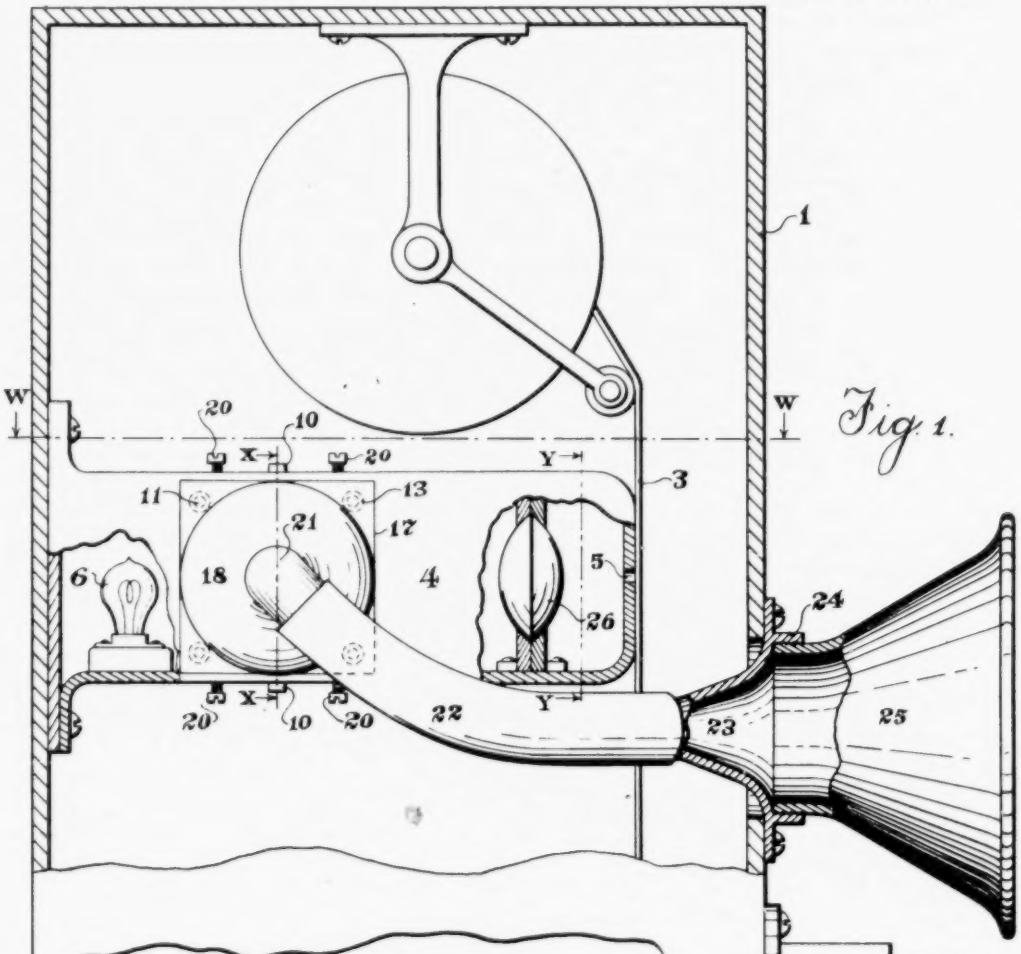


Fig. 1.

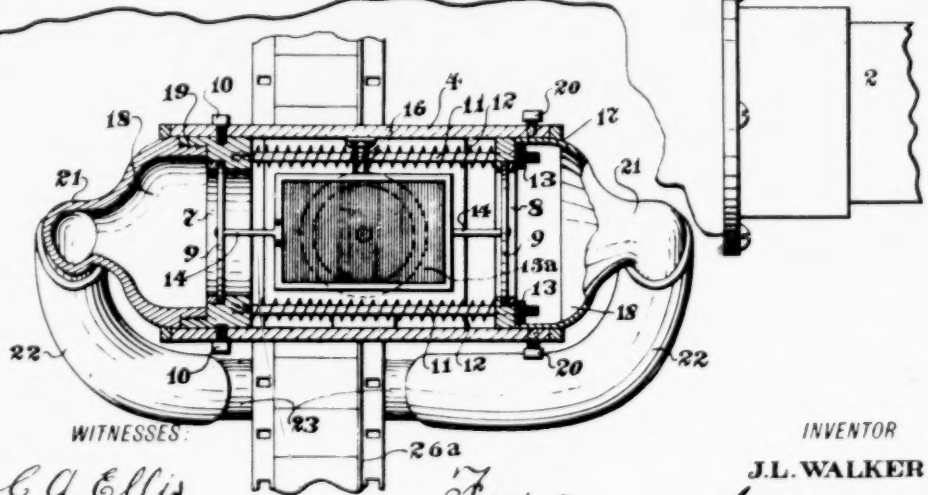


Fig. 3.

WITNESSES:

C. A. Ellis.

R. E. Bruckner.

INVENTOR

J. L. WALKER

BY John McSpellman

ATTORNEY

J. L. WALKER.

VOICE RECORDING AND REPRODUCING DEVICE.

APPLICATION FILED SEPT. 2, 1913.

1,186,717.

Patented June 13, 1916.

5 SHEETS—SHEET 2.

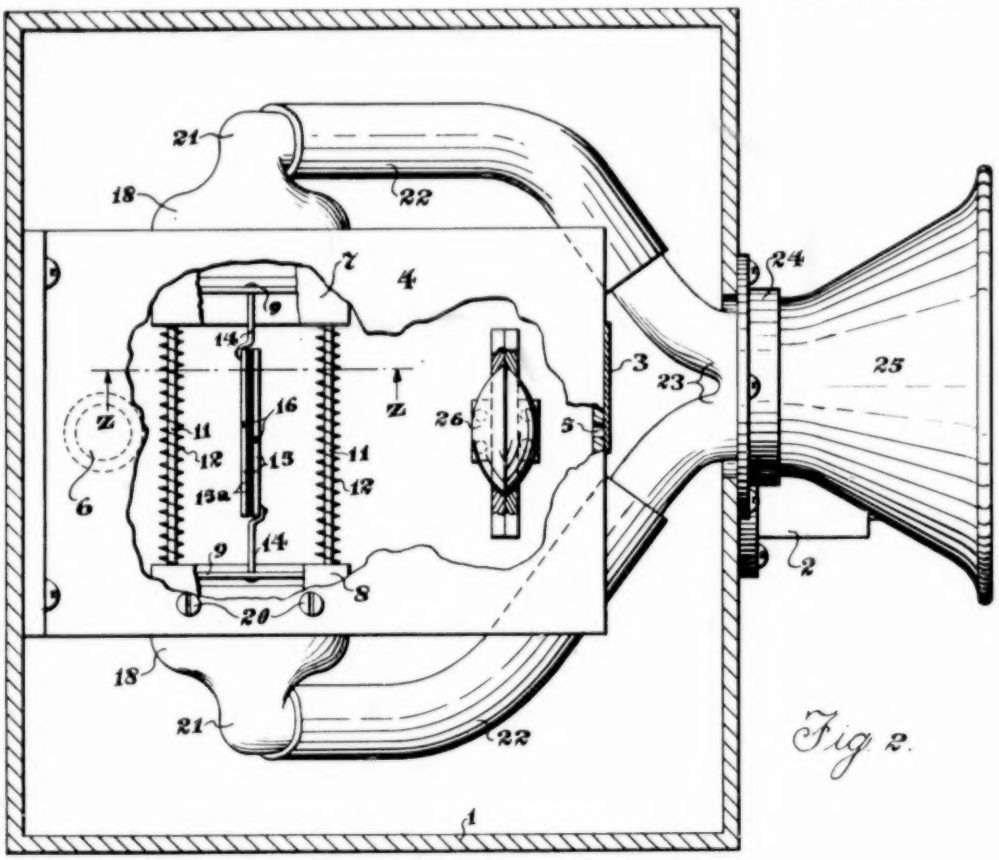


Fig. 2.

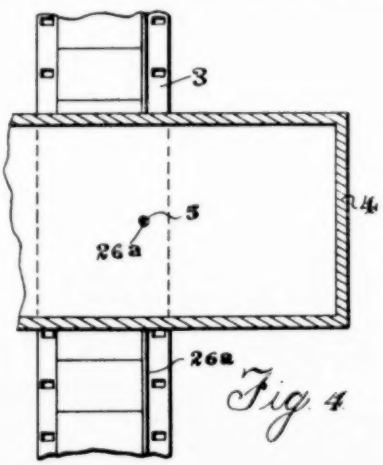


Fig. 4

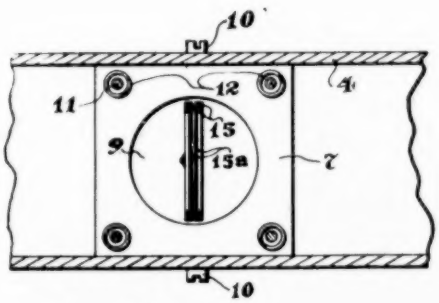


Fig. 5

WITNESSES:

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R. E. Bruckner.

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BY John McClelland.

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J. L. WALKER.

VOICE RECORDING AND REPRODUCING DEVICE.

APPLICATION FILED SEPT. 2, 1913.

1,186,717.

Patented June 13, 1916.

5 SHEETS—SHEET 3.

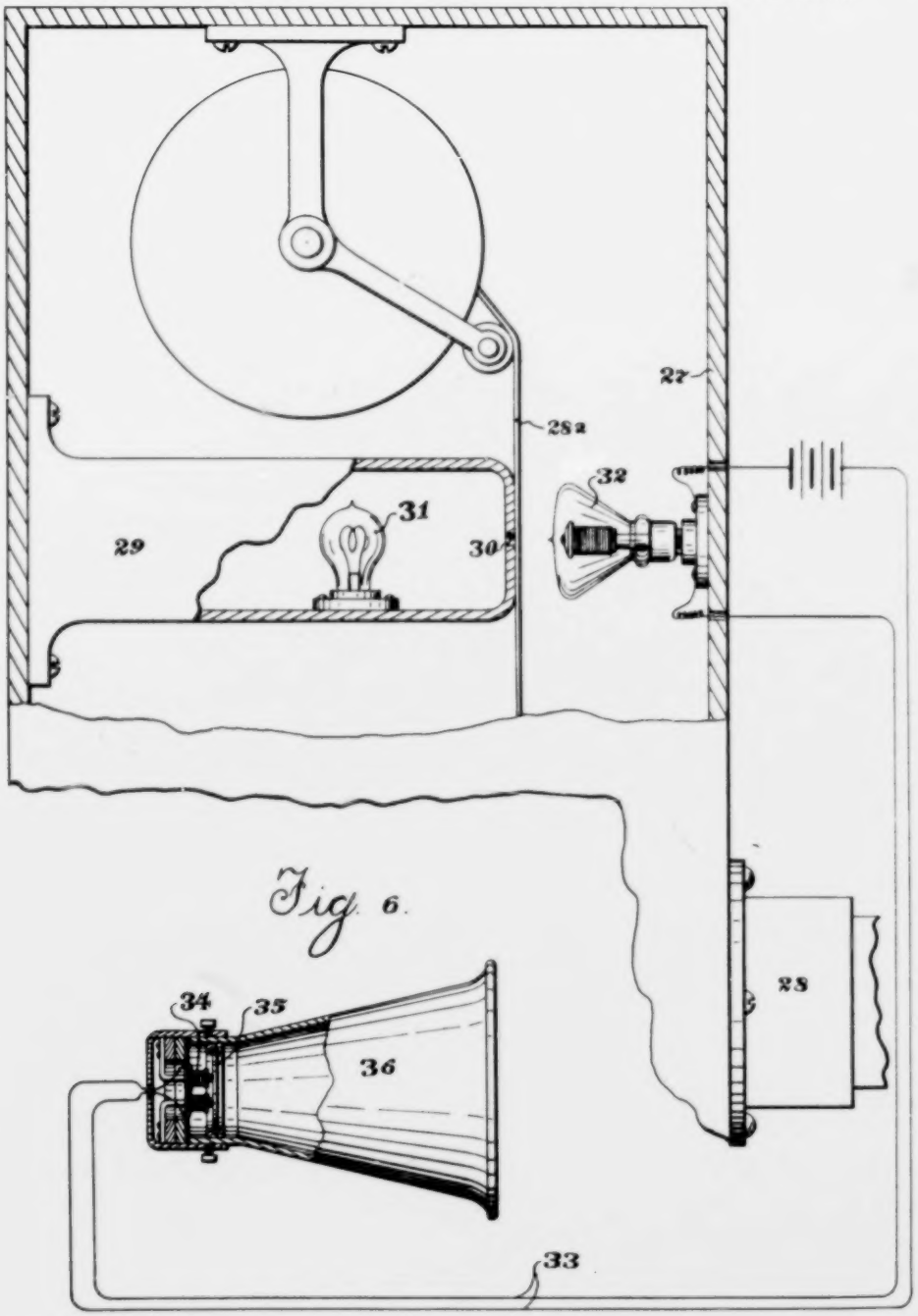

Fig. 6.

WITNESSES:

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5 SHEETS—SHEET 4.

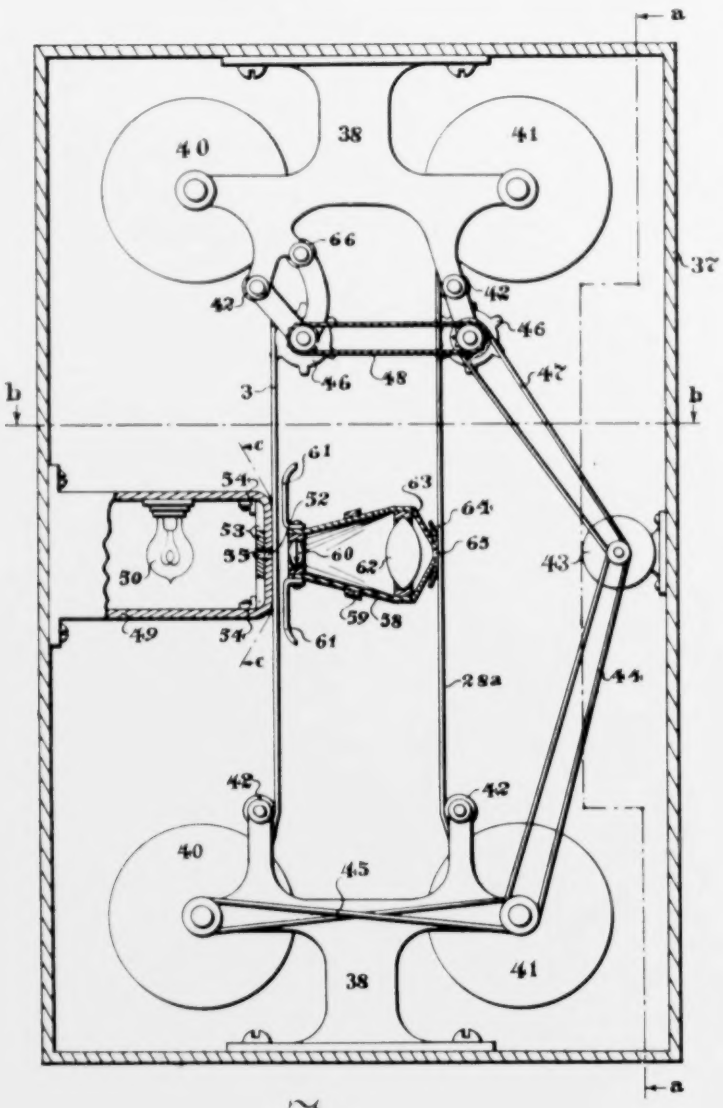

Fig. 7.

WITNESSES.

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856

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VOICE RECORDING AND REPRODUCING DEVICE.

APPLICATION FILED SEPT. 2, 1913.

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5 SHEETS—SHEET 5.

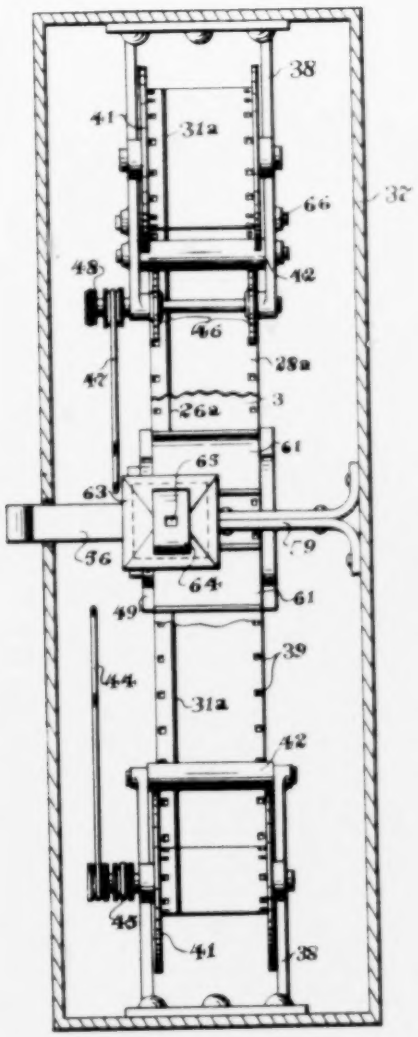

Fig. 8.

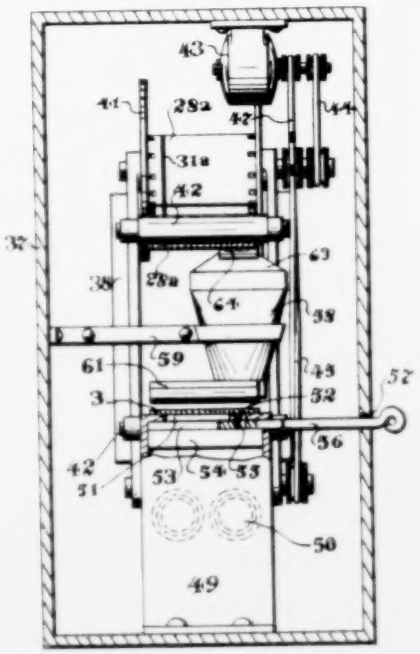

Fig. 9

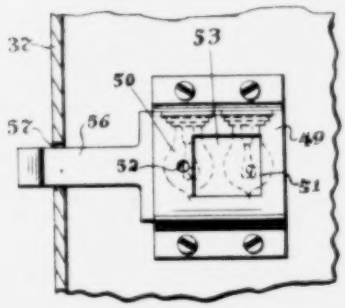

Fig. 10

WITNESSES:

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A. E. Bruckner.

INVENTOR

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BY John McGrellman.

ATTORNEY

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UNITED STATES PATENT OFFICE.

JACK L. WALKER, OF DALLAS, TEXAS.

VOICE RECORDING AND REPRODUCING DEVICE.

1,186,717. Specification of Letters Patent. Patented June 13, 1916.

Application filed September 2, 1913. Serial No. 787,682.

To all whom it may concern:

Be it known that I, JACK L. WALKER, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Voice Recording and Reproducing Devices, of which the following is a specification.

My invention relates to a new and useful sound recording and reproducing device. Its object is to provide an attachment for a moving picture camera, which, while a picture is being taken, will produce upon the film receiving the picture a continuous photographic record of sounds that appropriately accompany the picture.

Another object is to provide an apparatus that will cause a certain quantity of light to vary in intensity proportionately with sound vibrations of air, so that by focusing the light upon a strip of moving film, a photographic record of the sounds may be produced.

A further object is to provide an attachment for a moving picture projecting machine, which, when a strip of film carrying a photographic sound record is traveling before the projecting lens, will reproduce from the film the sounds recorded thereupon, the projecting pictures and reproduced sounds being synchronous.

A still further object is to provide a means for reproducing sound from a photographic record carried by a film by maintaining travel of the film and focusing light through its record-carrying portion upon a selenium cell, contained in an electrical circuit with an electro-magnetic sound reproducer, causing the resistance of the circuit to vary proportionately as the record on the film varies in transparency.

Still another object is to provide a means by which a continuous sound record photographically produced upon a negative film may be accurately reproduced upon a positive film in an enlarged size.

Finally, the object of my invention is to provide a device of the character described, that will be strong, durable, simple and efficient and comparatively easy to construct.

With these and various other objects in lowing specification, and illustrated in the accompanying drawings, wherein:

Figure 1 is a view, showing in side elevation, my attachment for a moving picture camera, together with certain interior portions of the camera. Fig. 2 is a horizontal sectional view of the same, the section being taken upon the line W—W of Fig. 1. Fig. 3 is a detail sectional view taken upon X—X of Fig. 1. Fig. 4 is a detail sectional view taken upon the line Y—Y of Fig. 1. Fig. 5 is a detail sectional view taken upon the line Z—Z of Fig. 2. Fig. 6 is a view, showing in side elevation my attachment for a moving picture projecting machine, together with certain interior portions of the machine, this view being also made to include an electro-magnetic sound reproducer which is shown diagrammatically connected with the projecting machine by an electrical circuit. Fig. 7 is a view showing in side elevation my machine for transferring an enlarged sound record from the negative to a positive film, the casing of the machine being shown in section. Fig. 8 is a vertical sectional view of the same taken upon the line *a—a* of Fig. 7. Fig. 9 is a detail horizontal sectional view taken upon the line *b—b* of Fig. 7. Fig. 10 is a detail vertical sectional view taken upon the line *c—c* of Fig. 7.

Referring now more particularly to the drawings, wherein like reference characters designate similar parts in all the figures, the numeral 1 denotes the casing of a moving picture camera, having the usual lens holder 2, opposite to which a strip of film 3 is adapted to travel within the camera.

The particular manner of supporting the film and actuating its travel is old and therefore requires no description or illustration in connection with my device.

At an elevation above the lens holder 2, the film 3 has contact with the front end of a rectangular box 4 impervious to light mounted upon the rear wall of the casing, the front wall of said box being formed with a pin hole aperture 5, opposite to one of the edge portions of the film. In the rear portion of the box 4, there is mounted an incandescent electric bulb 6, which may

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VOICE RECORDING AND REPRODUCING DEVICE.

APPLICATION FILED SEPT. 2, 1913.

1,186,717.

Patented June 13, 1916.

5 SHEETS—SHEET 5.

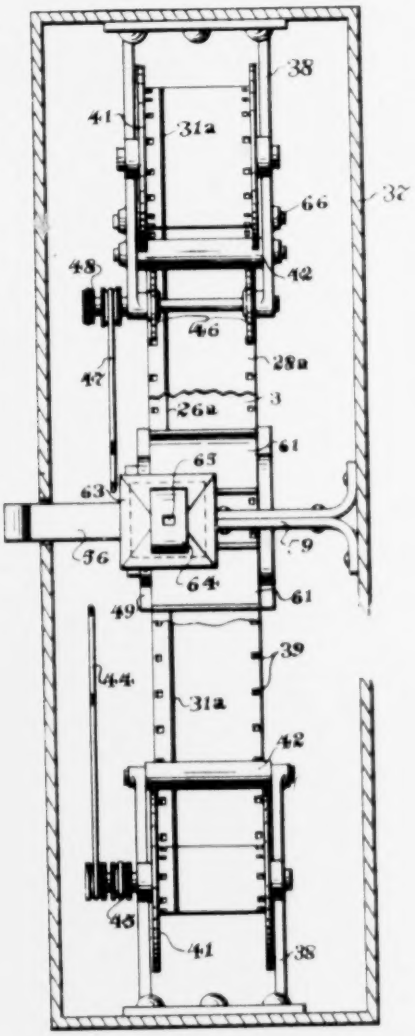

Fig. 8.

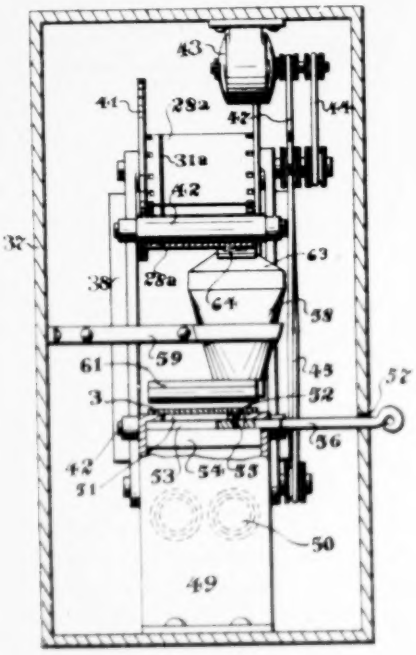

Fig. 9

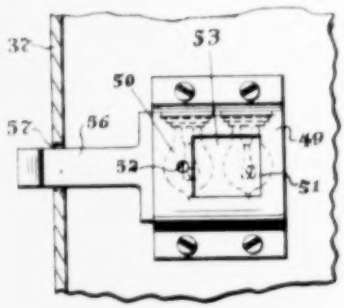

Fig. 10

WITNESSES

E. A. Ellis

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INVENTOR

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BY John McSpelliman

ATTORNEY

UNITED STATES PATENT OFFICE.

JACK L. WALKER, OF DALLAS, TEXAS.

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1,186,717. Specification of Letters Patent. Patented June 13, 1916.

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My invention relates to a new and useful sound recording and reproducing device. Its object is to provide an attachment for a moving picture camera, which, while a picture is being taken, will produce upon the film receiving the picture a continuous photographic record of sounds that appropriately accompany the picture.

Another object is to provide an apparatus that will cause a certain quantity of light to vary in intensity proportionately with sound vibrations of air, so that by focusing the light upon a strip of moving film, a photographic record of the sounds may be produced.

A further object is to provide an attachment for a moving picture projecting machine, which, when a strip of film carrying a photographic sound record is traveling before the projecting lens, will reproduce from the film the sounds recorded thereupon, the projecting pictures and reproduced sounds being synchronous.

A still further object is to provide a means for reproducing sound from a photographic record carried by a film by maintaining travel of the film and focusing light through its record-carrying portion upon a selenium cell, contained in an electrical circuit with an electro-magnetic sound reproducer, causing the resistance of the circuit to vary proportionately as the record on the film varies in transparency.

Still another object is to provide a means by which a continuous sound record photographically produced upon a negative film may be accurately reproduced upon a positive film in an enlarged size.

Finally, the object of my invention is to provide a device of the character described, that will be strong, durable, simple and efficient and comparatively easy to construct.

With these and various other objects in view, my invention has relation to certain novel features of construction and operation, an example of which is described in the following specification, and illustrated in the accompanying drawings, wherein:

Figure 1 is a view, showing in side elevation, my attachment for a moving picture camera, together with certain interior portions of the camera. Fig. 2 is a horizontal sectional view of the same, the section being taken upon the line W—W of Fig. 1. Fig. 3 is a detail sectional view taken upon X—X of Fig. 1. Fig. 4 is a detail sectional view taken upon the line Y—Y of Fig. 1. Fig. 5 is a detail sectional view taken upon the line Z—Z of Fig. 2. Fig. 6 is a view, showing in side elevation my attachment for a moving picture projecting machine, together with certain interior portions of the machine, this view being also made to include an electro-magnetic sound reproducer which is shown diagrammatically connected with the projecting machine by an electrical circuit. Fig. 7 is a view showing in side elevation my machine for transferring an enlarged sound record from the negative to a positive film, the casing of the machine being shown in section. Fig. 8 is a vertical sectional view of the same taken upon the line *a*—*a* of Fig. 7. Fig. 9 is a detail horizontal sectional view taken upon the line *b*—*b* of Fig. 7. Fig. 10 is a detail vertical sectional view taken upon the line *c*—*c* of Fig. 7.

Referring now more particularly to the drawings, wherein like reference characters designate similar parts in all the figures, the numeral 1 denotes the casing of a moving picture camera, having the usual lens holder 2, opposite to which a strip of film 3 is adapted to travel within the camera.

The particular manner of supporting the film and actuating its travel is old and therefore requires no description or illustration in connection with my device.

At an elevation above the lens holder 2, the film 3 has contact with the front end of a rectangular box 4 impervious to light mounted upon the rear wall of the casing, the front wall of said box being formed with a pin hole aperture 5, opposite to one of the edge portions of the film. In the rear portion of the box 4, there is mounted an incandescent electric bulb 6, which may derive current from any suitable source. In the middle portion of the box 4, a pair of rectangular frames 7 and 8 are mounted

oppositely and respectively adjacent to the side walls of the box, said frames serving to mount similar circular diaphragms 9. The frame 7 is permanenuly engaged in a rigid relation with the box 4 by two cap screws 10, one of which enters said frame through the top of the box and one through the bottom thereof. The two frames 7 and 8 are connected at their corners by four elongated horizontal bolts 11, mounted fast in the frame 7, but passing freely through the frame 8. Upon each bolt 11, there is mounted a coiled spring 12 having its extremities respectively abutting against the two frames, serving to hold the frame 8, firmly pressed against adjusting thumb-nuts 13 mounted upon the free ends of the bolts 11. By means of said thumb-nuts, the frame 8 may be subjected to a delicate adjustment to or from the frame 7. To the centers of the diaphragms 9, there are secured short horizontally alined wires 14, which are respectively connected with two rectangular frames 15 containing sheets of mica or some similar transparent substance, indicated by the numeral 15ª. Said sheets of mica are suspended vertically and transversely of the box 4 by threads 16, attached to the top of said box, midway between its side walls and centrally secured to the upper edges of the members 15. The threads 16 and wires 14 together hold the members 15ª in a slightly spaced relation. Upon each of the members 15ª, there are provided a plurality of very closely adjacent vertical lines of a black or other opaque color. The side walls of the box 4 are formed opposite to the diaphragms 9 with rectangular apertures 17, into each of which there is fitted a metallic sound transmitter 18, one of which has a screw-threaded connection with the frame 7 as indicated at 19, while the other is held in place by set-screws 20, passing respectively through the top and bottom walls of the box 4. The transmitters 18 are formed with integral elbows 21, which respectively communicate with tubes 22, (preferably flexible) extending toward the front of the casing 1, above the lens holder 2, and communicating with a member 23 mounted in the front casing wall. The member 23 is formed with an annular threaded flange 24, receiving a member 25 having the form of an ordinary telephone mouth-piece.

In the front portion of the box 4, there is mounted a lens 26, so disposed that such light from the lamp 6 as reaches said lens through the members 15 will be focused through the aperture 5 upon an edge portion of the film 3, forming a line 26ª thereon.

An explanation will now be given as to the operation of the above described attachment. The film 3 is properly lighted, and the travel of the film is maintained in the usual manner. The air vibrations created by the various sounds accompanying the picture, are conducted by a mouth-piece 25 and the tubes 22 to the diaphragms 9 causing the same to vibrate in synchronism with the air vibrations. From the diaphragms 9, these same vibrations are communicated to the members 15ª, the vibrating motion of said members being parallel and opposite. When the members 15ª are at rest, the vertical lines provided upon one of said members will be opposite to the spaces between the lines provided upon the other member so that a negligible quantity of light from the lamp 6 will pass through the two members. But when the two members are in vibratory motion, the relation between the lines formed upon the two members will be constantly varying, the magnitude of this variation being proportionate to the magnitude of the air vibrations. While the members 15ª are in vibration, therefore, a constantly varying quantity of light emitted by the lamp 6 will pass through the members 15ª, the intensity of this light, varying in unison with the intensity of the vibratory force acting upon the members 15ª. A certain quantity of the light thus passing through the members 15ª will pass also through the lens 26 which will focus this light upon the moving film 3 through the aperture 5, thus producing upon the sensitized surface of the film the line 26ª parallel and adjacent to one of the film edges. This line will vary in transparency according as the light which produced it varied in intensity, and hence will be an accurate photographic record of the sounds produced in the vicinity of the camera during the taking of a moving picture, each sound being recorded adjacent to the pictures taken while the sound was being produced.

A description will now be given of an attachment to a moving picture projecting machine, which attachment serves to reproduce the sounds recorded upon a film in the manner set forth in the preceding description. The casing 27 of the projecting machine is provided with the usual lens holder 28, opposite to which a film 28ª is adapted to travel vertically within said casing. The means for supporting the film within said casing and for actuating its travel are not new and require no description or illustration herein. A rectangular box 29 is mounted within the casing 1 upon the rear wall thereof in substantially the same relation to the member 28 and to the film 28ª as has been already described in connection with the moving picture camera attachment. In the front of the box 29 is formed a pin-hole aperture 30, through which light from an

carried by an edge portion of the strip 28ª. The record line 31ª carried by the film 28ª has precisely the same variations in transparency as that produced upon the film 3, but has a greater width. The means for producing the line 31ª are hereinafter described. Directly opposite to the aperture 30, a selenium cell 32 is mounted upon the front wall of the casing, said cell being contained in a circuit 33 in which are also included the coils 34 of a powerful sound transmitter, the diaphragm of which is indicated at 35 and the sound amplifying horn at 36. Any suitable source of electromotive force may be included in the circuit 33.

In the operation of my attachment to a motion picture projecting machine the light 31 will be maintained constantly lighted while the film 28ª is in motion. The rays from the lamp 31 passing through the aperture 30 and through the record line 31ª upon the film will impinge upon the selenium cell 32, with an intensity varying as the transparency of the record varies. This will cause the resistance of the circuit 33 to vary in synchronism with the variations in transparency of the sound record so that the resulting vibrations of the diaphragm 35 will reproduce the sounds recorded upon the film. Since the sounds recorded upon the film are reproduced simultaneously with the projection of pictures made during the production of the sounds, the projection of the pictures upon the film will be synchronous with the sound reproduction. That this synchronism may be perfect, the rays of light should pass through the record line 31ª at the same distance above the lens-holder as in the moving picture camera attachment.

A description will now be given of a machine which is employed to produce upon a positive film 28ª an enlarged reproduction of the sound-record line 26ª formed as previously described upon a negative film. Within a casing 37, upon the top and bottom thereof, there are respectively mounted pairs of brackets 38, each pair of brackets serving to rotatably support a pair of horizontally alined film reels 40 and 41. The reels 40 and the reels 41 are respectively vertically alined. The upper reel 40 when mounted in its correlated brackets carries a negative film 3, which film is vertically extended to the lower reel 40 upon which it is adapted to be wound. The upper reel 41 when placed in its correlated bracket carries a positive film 28ª which is extended vertically to the lower reel 41 upon which it is adapted to be wound. The vertical portions of the two films 3 and 28ª have a parallel spaced relation. Each pair of brackets 38 carries a pair of guide rollers 42, which serve to hold the vertical portions of the

The two films are adapted to travel downwardly at exactly the same rate of speed, their travel being induced by a small electric motor 43 driving the lower reel 41 through a belt 44. The lower reel 41 drives the lower reel 40 through a crossed belt 45. The lowermost reels 40 and 41 are driven, not to actuate the travel of the films, but to take up the slack of the films as they are driven downwardly. The mechanism for driving the films comprises two pairs of star wheels 46 mounted in the upper pair of brackets 38, engaging the lines of perforation 39 carried by the edge portions of the two films. The star wheels driving the film 28ª are driven from the motor 43 through a belt 47, and the other pair of star wheels is driven by a sprocket chain 48 carried by sprocket wheels mounted upon the spindles of the star wheels.

The vertical portion of the film 3 is contiguous with one end of a closed box 49, containing a lamp or a plurality of lamps 50, the other end of which box is mounted fast upon the casing 37. That end of the box 49 with which the film 3 is contiguous, is formed with a rectangular opening 51, having its vertical edges alined with the vertical edges of the picture carrying portion of the film, and having a height equal to one of the pictures carried by the film 3. In the same wall of the box 49, there is formed a pin hole aperture 52 which is alined with the record line 26ª. Within the box 49, there is mounted a shutter 53 which is held contiguous with the apertured end of said box by angular strips 54 respectively secured to the top and bottom of said box. The shutter 53 is imperforate except for the pin hole aperture 55, which in one limiting position of the shutter is alined with the aperture 52. In the same limiting position of the shutter, it completely covers the rectangular aperture 51, preventing any light escaping from the box 49 except through the pin-hole apertures 55 and 52. In the other limiting position of said shutter, the same is shifted to a large extent out of the box 49 uncovering the rectangular aperture 51 and covering the pin-hole aperture 52. The means for shifting the shutter 53 between its limiting positions comprises a handle member 56 integrally formed with the shutter and passing through an aperture 57 in the casing 37.

Between the vertical portions of the films 3 and 28ª, there is mounted a funnel-shaped casing 58 having its center line transverse of the films and passing through the aperture 52. The member 58 is supported rigidly by a bracket 59 secured to one of the walls of the casing 37. In the small end of the member 58, which end is closely adjacent

oppositely and respectively adjacent to the side walls of the box, said frames serving to mount similar circular diaphragms 9. The frame 7 is permanently engaged in a rigid relation with the box 4 by two cap screws 10, one of which enters said frame through the top of the box and one through the bottom thereof. The two frames 7 and 8 are connected at their corners by four elongated horizontal bolts 11, mounted fast in the frame 7, but passing freely through the frame 8. Upon each bolt 11, there is mounted a coiled spring 12 having its extremities respectively abutting against the two frames, serving to hold the frame 8, firmly pressed against adjusting thumb-nuts 13 mounted upon the free ends of the bolts 11. By means of said thumb-nuts, the frame 8 may be subjected to a delicate adjustment to or from the frame 7. To the centers of the diaphragms 9, there are secured short horizontally alined wires 14, which are respectively connected with two rectangular frames 15 containing sheets of mica or some similar transparent substance, indicated by the numeral 15^a. Said sheets of mica are suspended vertically and transversely of the box 4 by threads 16, attached to the top of said box, midway between its side walls and centrally secured to the upper edges of the members 15. The threads 16 and wires 14 together hold the members 15^a in a slightly spaced relation. Upon each of the members 15^a, there are provided a plurality of very closely adjacent vertical lines of a black or other opaque color. The side walls of the box 4 are formed opposite to the diaphragms 9 with rectangular apertures 17, into each of which there is fitted a metallic sound transmitter 18, one of which has a screw-threaded connection with the frame 7 as indicated at 19, while the other is held in place by set-screws 20, passing respectively through the top and bottom walls of the box 4. The transmitters 18 are formed with integral elbows 21, which respectively communicate with tubes 22, (preferably flexible) extending toward the front of the casing 1, above the lens holder 2, and communicating with a member 23 mounted in the front casing wall. The member 23 is formed with an annular threaded flange 24, receiving a member 25 having the form of an ordinary telephone mouth-piece.

In the front portion of the box 4, there is mounted a lens 26, so disposed that such light from the lamp 6 as reaches said lens through the members 15 will be focused through the aperture 5 upon an edge portion of the film 3, forming a line 26^a thereupon.

An explanation will now be given as to the operation of the above described attachment to a moving picture camera. While a picture is being taken, the lamp 6 is kept lighted, and the travel of the film is maintained in the usual manner. The air vibrations created by the various sounds accompanying the picture, are conducted by a mouth-piece 25 and the tubes 22 to the diaphragms 9 causing the same to vibrate in synchronism with the air vibrations. From the diaphragms 9, these same vibrations are communicated to the members 15^a, the vibrating motion of said members being parallel and opposite. When the members 15^a are at rest, the vertical lines provided upon one of said members will be opposite to the spaces between the lines provided upon the other member so that a negligible quantity of light from the lamp 6 will pass through the two members. But when the two members are in vibratory motion, the relation between the lines formed upon the two members will be constantly varying, the magnitude of this variation being proportionate to the magnitude of the air vibrations. While the members 15^a are in vibration, therefore, a constantly varying quantity of light emitted by the lamp 6 will pass through the members 15^a, the intensity of this light, varying in unison with the intensity of the vibratory force acting upon the members 15^a. A certain quantity of the light thus passing through the members 15^a will pass also through the lens 26 which will focus this light upon the moving film 3 through the aperture 5, thus producing upon the sensitized surface of the film the line 26^a parallel and adjacent to one of the film edges. This line will vary in transparency according as the light which produced it varied in intensity, and hence will be an accurate photographic record of the sounds produced in the vicinity of the camera during the taking of a moving picture, each sound being recorded adjacent to the pictures taken while the sound was being produced.

A description will now be given of an attachment to a moving picture projecting machine, which attachment serves to reproduce the sounds recorded upon a film in the manner set forth in the preceding description. The casing 27 of the projecting machine is provided with the usual lens holder 28, opposite to which a film 28^a is adapted to travel vertically within said casing. The means for supporting the film within said casing and for actuating its travel are not new and require no description or illustration herein. A rectangular box 29 is mounted within the casing 1 upon the rear wall thereof in substantially the same relation to the member 28 and to the film 28^a as has been already described in connection with the moving picture camera attachment. In the front of the box 29 is formed a pin-hole aperture 30, through which light from an incandescent bulb 31 within the box may reach and pass through a record line 31^a

carried by an edge portion of the strip 28ª. The record line 31ª carried by the film 28ª has precisely the same variations in transparency as that produced upon the film 3, but has a greater width. The means for producing the line 31ª are hereinafter described. Directly opposite to the aperture 30, a selenium cell 32 is mounted upon the front wall of the casing, said cell being contained in a circuit 33 in which are also included the coils 34 of a powerful sound transmitter, the diaphragm of which is indicated at 35 and the sound amplifying horn at 36. Any suitable source of electromotive force may be included in the circuit 33.

In the operation of my attachment to a motion picture projecting machine the light 31 will be maintained constantly lighted while the film 28ª is in motion. The rays from the lamp 31 passing through the aperture 30 and through the record line 31ª upon the film will impinge upon the selenium cell 32, with an intensity varying as the transparency of the record varies. This will cause the resistance of the circuit 33 to vary in synchronism with the variations in transparency of the sound record so that the resulting vibrations of the diaphragm 35 will reproduce the sounds recorded upon the film. Since the sounds recorded upon the film are reproduced simultaneously with the projection of pictures made during the production of the sounds, the projection of the pictures upon the film will be synchronous with the sound reproduction. That this synchronism may be perfect, the rays of light should pass through the record line 31ª at the same distance above the lens-holder as in the moving picture camera attachment.

A description will now be given of a machine which is employed to produce upon a positive film 28ª an enlarged reproduction of the sound-record line 26ª formed as previously described upon a negative film. Within a casing 37, upon the top and bottom thereof, there are respectively mounted pairs of brackets 38, each pair of brackets serving to rotatably support a pair of horizontally alined film reels 40 and 41. The reels 40 and the reels 41 are respectively vertically alined. The upper reel 40 when mounted in its correlated brackets carries a negative film 3, which film is vertically extended to the lower reel 40 upon which it is adapted to be wound. The upper reel 41 when placed in its correlated bracket carries a positive film 28ª which is extended vertically to the lower reel 41 upon which it is adapted to be wound. The vertical portions of the two films 3 and 28ª have a parallel spaced relation. Each pair of brackets 38 carries a pair of guide rollers 42, which serve to hold the vertical portions of the two films constantly spaced the same distance during their travel.

The two films are adapted to travel downwardly at exactly the same rate of speed, their travel being induced by a small electric motor 43 driving the lower reel 41 through a belt 44. The lower reel 41 drives the lower reel 40 through a crossed belt 45. The lowermost reels 40 and 41 are driven, not to actuate the travel of the films, but to take up the slack of the films as they are driven downwardly. The mechanism for driving the films comprises two pairs of star wheels 46 mounted in the upper pair of brackets 38, engaging the lines of perforation 39 carried by the edge portions of the two films. The star wheels driving the film 28ª are driven from the motor 43 through a belt 47, and the other pair of star wheels is driven by a sprocket chain 48 carried by sprocket wheels mounted upon the spindles of the star wheels.

The vertical portion of the film 3 is contiguous with one end of a closed box 49, containing a lamp or a plurality of lamps 50, the other end of which box is mounted fast upon the casing 37. That end of the box 49 with which the film 3 is contiguous, is formed with a rectangular opening 51, having its vertical edges alined with the vertical edges of the picture carrying portion of the film, and having a height equal to one of the pictures carried by the film 3. In the same wall of the box 49, there is formed a pin hole aperture 52 which is alined with the record line 26ª. Within the box 49, there is mounted a shutter 53 which is held contiguous with the apertured end of said box by angular strips 54 respectively secured to the top and bottom of said box. The shutter 53 is imperforate except for the pin hole aperture 55, which in one limiting position of the shutter is alined with the aperture 52. In the same limiting position of the shutter, it completely covers the rectangular aperture 51, preventing any light escaping from the box 49 except through the pin-hole apertures 55 and 52. In the other limiting position of said shutter, the same is shifted to a large extent out of the box 49 uncovering the rectangular aperture 51 and covering the pin-hole aperture 52. The means for shifting the shutter 53 between its limiting positions comprises a handle member 56 integrally formed with the shutter and passing through an aperture 57 in the casing 37.

Between the vertical portions of the films 3 and 28ª, there is mounted a funnel-shaped casing 58 having its center line transverse of the films and passing through the aperture 52. The member 58 is supported rigidly by a bracket 59 secured to one of the walls of the casing 37. In the small end of the member 58, which end is closely adjacent to the box 49, there is secured a pair of guide plates 61 respectively extending upwardly

and downwardly, and curved at their free extremities slightly away from the adjacent film, guiding the same between said plates and the box 49. Within the small end of the casing 58, is centrally mounted a double convex lens 60, which will transmit any rays of light passing through the apertures 55 and 52 and through the film and will conduct said rays divergently to a larger cylinder lens 62 mounted in the large end of the member 58. The lens 62 will converge the rays of light passing through it, focusing them in a small rectangle upon an edge portion of the film 28^a. To prevent any diffusion of these rays such as might cause some of them to impinge upon the central portion of the film 28^a, the large end of the casing 58 is inclosed as indicated at 63, the member 63 being formed with a slit 65 through which the rays are projected upon the film 28^a. Above and below the slit 65, curved guide plates 64 may be secured to the member 63 to steady the film 28^a during its vertical travel.

An explanation will now be given as to the operation of the device which has just been described. The object of this device is to reproduce the record line carried by the negative film 3 in an enlarged size upon the positive film 28^a, so that when the positive film is passed through a projecting machine carrying my sound reproducing attachment, a larger quantity of light may be made to vary in intensity synchronously with a certain succession of sounds, so that the fluctuations in the resistance of the selenium cell previously mentioned may be more pronounced. During the process of enlarging the record line, the films 3 and 28^a will travel at a much slower rate than when said films are traveling either in the motion picture camera or projecting machine. Hence, in the enlarging machine, a much greater quantity of light will pass through every portion of the record line 26^a and will be focused in the form of a small rectangle upon the edge portion of the film 28^a. This light, in passing through the record line of the film 3 will vary in intensity according as said record line varies in transparency, and this light being focused upon the film 28^a will produce thereupon a record line 31^a varying in transparency uniformly with the record line 26^a. The enlargement of the line produced upon the film 28^a is due to the use of the concentrating cylinder lens 62.

The machine which has just been described may be employed also to print positively upon the film 28^a, the pictures negatively carried by the film 3. In using the machine for this purpose, the positive and negative films will be carried as before, respectively by the two upper reels 40 and 41. In this case, however, the positive film instead of passing vertically to the lower reel 41, will be extended over a roller 66 carried by the uppermost pair of brackets 38 and will then be extended downwardly contiguously with the film 3 passing with said film between the box 49 and the plates 61. After passing below the lower plate 61, the film 28^a will be extended to the lower reel 41 upon which it will be wound. The star wheels 46 engaging the apertures 39 of the film 3 will also engage the same apertures in the film 28^a, so that the one pair of star wheels will actuate the travel downwardly of the two films. The shutter 53 will now be shifted outwardly so as to leave the rectangular aperture 51 unobstructed allowing the light from the lamp 50 to pass through said aperture 51 and through the two films, the two films being actuated downwardly. The light passing through the film 3 will produce upon the sensitized face of the film 28^a positive reproductions of the negative pictures carried by the film 3.

In Figs. 9 and 10 the box 49 contains two lamps 50 of which the left hand lamp is used to reproduce the picture, when light from the other lamp is shut off by shutter 56. The right hand lamp is used, when the left hand lamp is shut off, in the reproduction of the magnified voice record.

The invention is presented as including all such modifications and changes as properly come within the scope of the following claim.

What I claim is:

In a device of the character described, the combination with an elongated strip of sensitized film, of means for inducing longitudinal travel of said strip, means for projecting light upon a portion of the film during its travel, a plurality of adjacent members interposed between the source of said light and the film, said members having alternate transparent and opaque portions of very small area, means for adjusting said members parallel to each other, vibratory diaphragms correlated with said members, and communicating their vibrations to the same, the joint transparency of said members being varied proportionately to the intensity of the vibrations communicated to the same, and means for conducting sound vibrations of air to said diaphragms.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JACK L. WALKER.

Witnesses:
J. S. MURRAY,
MAYBELLE REAVES.

R. M. CRAIG.

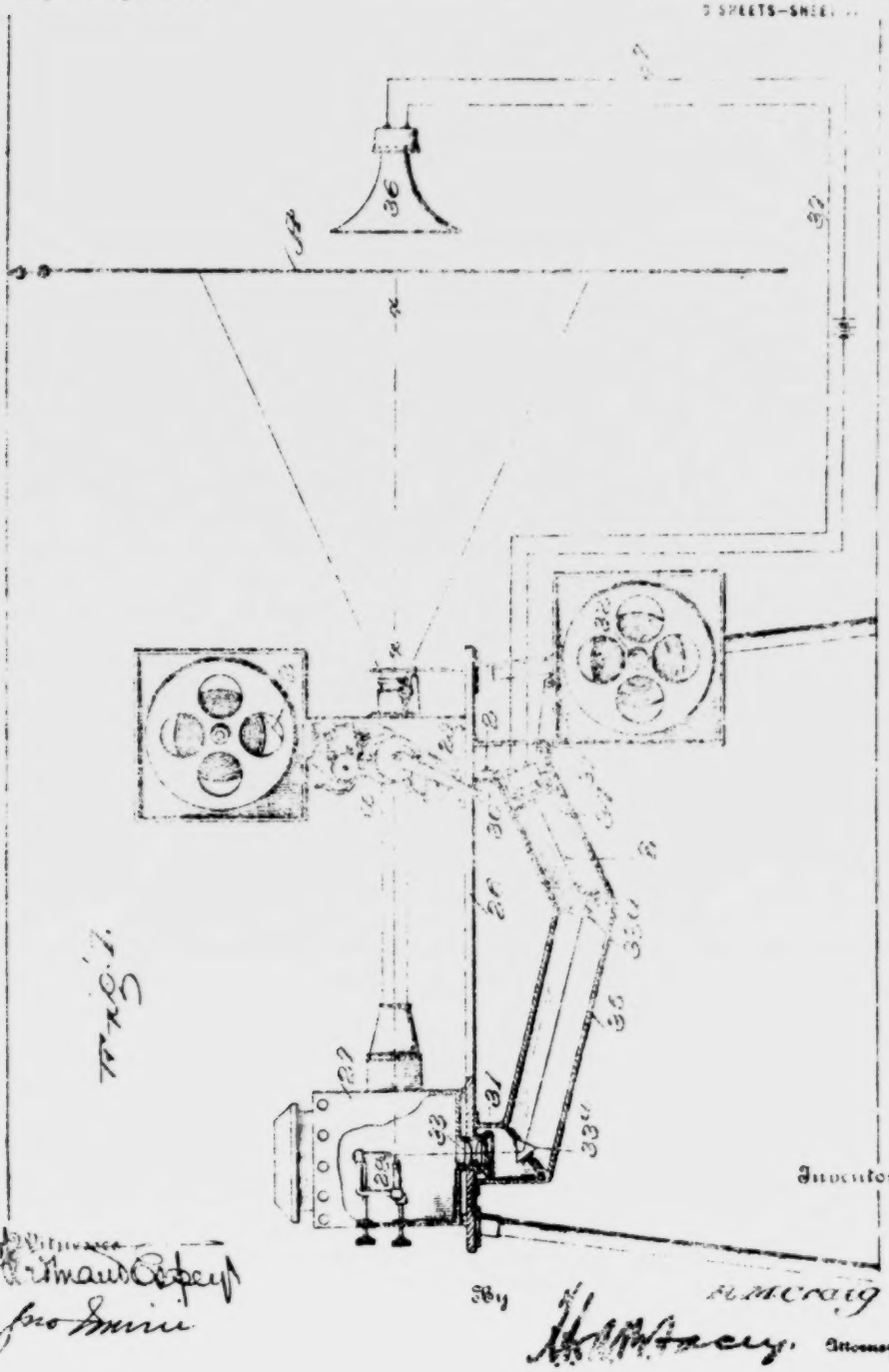
PHONOGRAPHIC ATTACHMENT FOR MOVING PICTURE MACHINES.

APPLICATION FILED MAY 6, 1913.

1,260,337.

Patented Mar. 26, 1918.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 2.

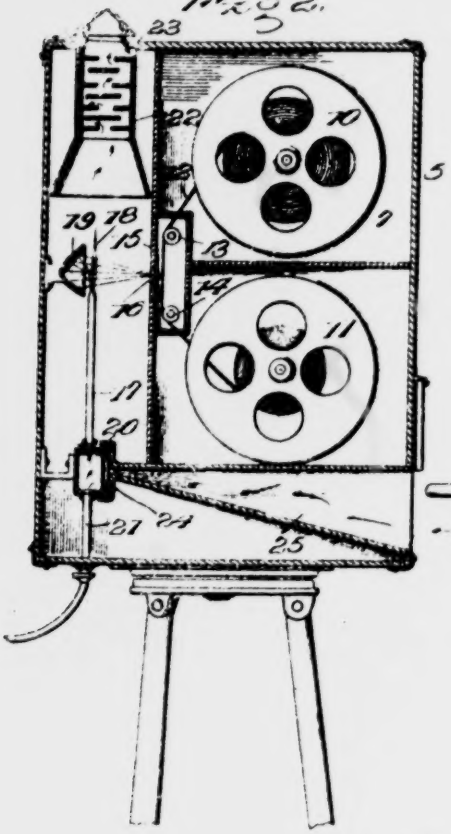


Fig. 3.

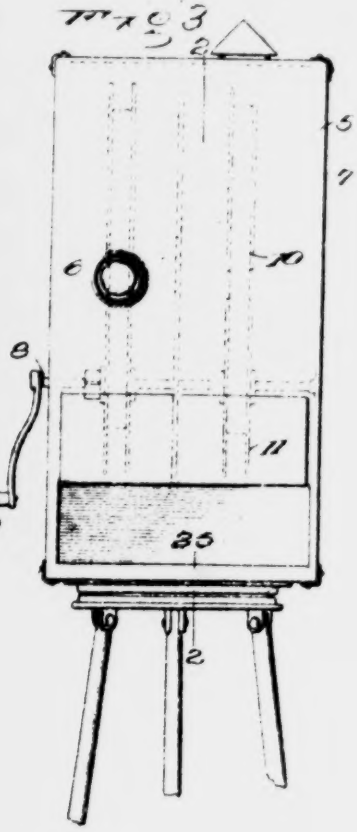
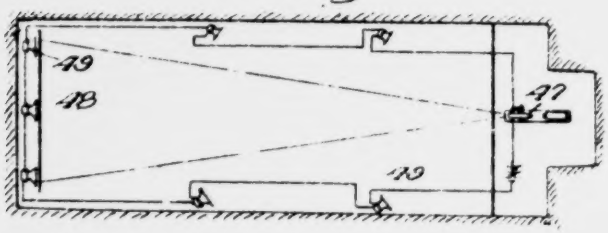


Fig. 4.



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PHONOGRAPHIC ATTACHMENT FOR MOVING PICTURE MACHINES.

APPLICATION FILED MAY 6, 1913.

1,260,337.

Patented Mar. 26, [illegible]

3 SHEETS-SHEET [illegible]

Fig. 5.

Fig. 6.

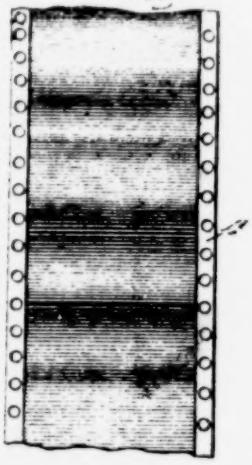


Fig. 7.

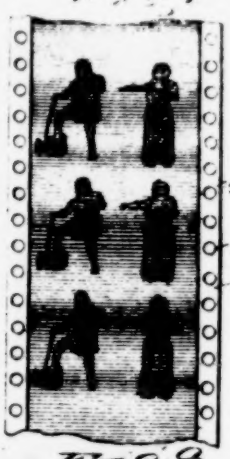


Fig. 7a.

Fig. 9.

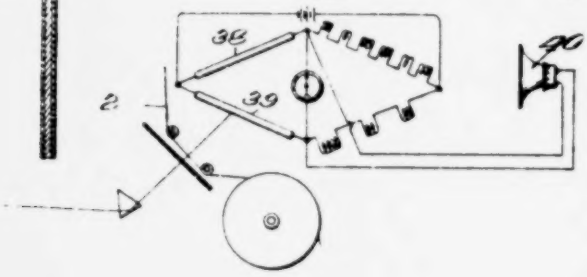
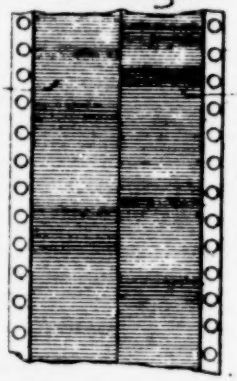


Fig. 8.



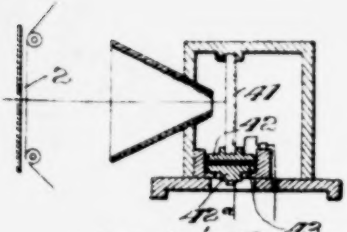


Fig. 10.

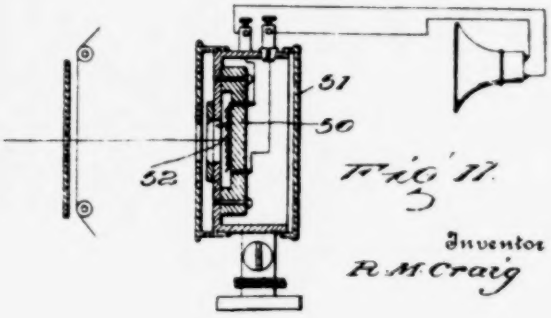


Fig. 11.

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RICHARD M. CRAIG, OF SAN ANTONIO, TEXAS.

PHONOGRAPHIC ATTACHMENT FOR MOVING-PICTURE MACHINES.

1,260,337. Specification of Letters Patent. Patented Mar. 26, 1918.

Application filed May 6, 1913. Serial No. 765,959.

To all whom it may concern:

Be it known that I, RICHARD M. CRAIG, citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented certain new and useful Improvements in Phonographic Attachments for Moving-Picture Machines, of which the following is a specification.

My invention relates to phonographic or "talking" moving pictures, and more particularly to the art of taking and projecting such moving pictures with the accompaniment of sound recording and sound reproduction respectively.

Many attempts have been made to secure with the reproduction of moving pictures, the reproduction of sounds correlated therewith. Almost all these attempts have been made by operating the moving picture film in conjunction with the ordinary phonograph or gramophone. The difficulty of using an instrument of this character to reproduce sounds correlated with the film is that the phonograph must of necessity be practically a separate machine from either the camera whereby the pictures are taken, or the projector whereby they are thrown upon the screen, and that with either the gramophone or the phonograph it is practically impossible to secure a sound record which shall be conterminus with the moving picture film. The maximum sound record as used today will not run for longer than five minutes, whereas the moving picture scene may be very much longer. Further than this, it is practically impossible to run the phonograph or gramophone in synchronism with the film and this is a very vital necessity for the proper correlation of the sound record with the pictures. Again, if the film runs off or breaks, the phonograph must be stopped, and it is almost impossible to again adjust the film in proper correspondence and correlation with the sound record. The mere connecting up of the sound reproducing mechanism with the mechanism of the moving picture machine will not secure a complete correspondence and correlation between the sound and the pictures, for the reason that the film is liable to slip and to tighten or loosen upon the reels, and it would be extremely hard to adjust the sound record so as to correspond accurately with the motion of the picture. An accurate correspondence of the sound with the event with which the sound is correlated, is, of course, absolutely necessary to prevent a disjunction which would entirely spoil the effect.

Furthermore, the phonographic record can naturally contain only so many words and this requires the film to be made of a certain length only, this length corresponding with the phonographic record, instead of which the sound record should be made for and with the picture record of any possible scene or happening that might occur, and the sound record should have the same length as the scene record and not be limited as to length.

Again, the process of making phonographic records requires extra care and especially prepared staging. The phonograph is placed at or near the screen upon which the picture is to be projected and thus can not be run by the same mechanism which drives the moving picture film. The phonograph requires an extra attendant to place the records thereon. Furthermore, the picture record and the sound record have heretofore been taken separately and could not therefore be in accurate correspondence, nor could they ever be placed in accurate correspondence under these circumstances. It is a very difficult problem and requires an elaborate arrangement of costly mechanism to keep a film synchronized with a phonographic record. If the film happens to run off while exhibiting the phonographic record and the pictures on the film get out of time, it is practically impossible to get them in time again. If the film should happen to get torn in two or broken, which sometimes happens, and the film is cemented together, the words corresponding to the part torn out of the film can never be taken from the phonograph record, and this destroys the further use of the two together.

The primary object of my invention is the provision of mechanism whereby a sound record may be made or reproduced synchronously with the taking or reproduction of moving pictures.

A further object is to so form the sound recording or reproducing mechanism that it may be used with ordinary moving picture taking or reproducing mechanism so that no change will be required in the mechanism now used for this purpose.

A further object is to provide means

whereby the picture record and the sound record may be recorded simultaneously and by the same machine, under the control of the same operator and not individually and separately as they now are.

A further object is to provide means whereby the picture carrier, that is, the film, may also be the sound record carrier so that the pictures and the corresponding sounds shall be at all times in fixed relation to each other, taken simultaneously, reproduced simultaneously and with no possible chance of the sound record having its relation to the picture record in any way changed.

A further object is to so form the sound and picture carrier, in this case the film, that the sound may be reproduced without reproducing the picture, or the picture reproduced without reproducing the sound.

A further object is to so form the sound record that the sound vibrations may be translated into electrical vibrations, and these in turn carried to various parts of the hall within which the machine is to be used.

A still further object is to so construct the machine both for taking and reproducing the pictures and accompanying sounds that the method of operation shall be extremely simple, both as regards the taking and making of sound records and the taking and making of picture records, and as to the simultaneous or synchronous taking or reproduction.

A further object is to provide mechanism whereby the sounds may be recorded upon the picture carrying film of moving picture machines and reproduced therefrom, this film being so formed that the picture record and the sound record may overlie each other without the sound record interfering with the picture record or vice versa.

A further object of the invention is to so form the film that the picture record may be taken in the ordinary manner and printed photographically upon one side or face of the film while the sound record may be taken photographically and printed upon the other face of the film.

A further object in this connection is to provide a film for carrying moving pictures and accompanying sound records, in which the sound record is formed by a substance which does not affect or impair the transmission of ordinary or white light but which will impair, affect or be more or less impervious to the passage of rays beyond the visible rays of the spectrum.

A further object is to form a sound record upon a film capable of transmitting light, this sound record being formed by material which is pervious to ordinary white light but which is impervious to or affects the transmission of infra-red rays.

A further object is to so construct the mechanism for reproducing a sound record in conjunction with the projection of moving pictures that while the film shall move at one point intermittently to reproduce the pictures, the film shall move steadily at another point to reproduce the sound record, and in this connection to provide mechanism for causing the projection of white light through that portion of the film which is moving intermittently and causing the projection of invisible rays through that portion of the film which is moving steadily, and further in this connection to provide in combination with the means for projecting the invisible rays through said film, sound transmitting mechanism of such character as to be operated by the action of these invisible rays to thereby reproduce the sound record on the film.

My invention is illustrated in the accompanying drawings wherein:

Figure 1 is an elevation partly sectional of a moving picture machine so constructed as to reproduce a corresponding sound, the figure also showing the screen upon which the picture record is thrown and a loud-speaking phone disposed behind the screen.

Fig. 2 is a vertical section on the line 2—2 of Fig. 3 of a camera for taking moving pictures making correlated sound records.

Fig. 3 is a front elevation of the camera shown in Fig. 2.

Fig. 4 is a diagrammatic plan view of a hall or auditorium showing the arrangement of phones for transmitting the sounds reproduced by my mechanism.

Fig. 5 is a fragmentary view of one side of a film showing moving pictures thereon.

Fig. 6 is a face view of the opposite side of a film showing photographic sound records thereon.

Fig. 7 is a view of a composite film showing the position of the sound records with relation to the pictures.

Fig. 7ª is a fragmentary section of the film shown in Fig. 7.

Fig. 8 is a face view of the sound record side of a film but illustrating a plurality of records on one film.

Fig. 9 is a diagrammatic view of a bolometer as used by me for the purpose of reproducing sound vibrations.

Fig. 10 is a diagrammatic view of another form of sound reproducing mechanism.

Fig. 11 is a diagrammatic view of another form of sound reproducing mechanism.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

My invention is based upon the fact that infra-red rays are invisible but that these rays will affect a properly sensitized photographic film, and that these infra-red rays will affect various forms of electrical phonographic receivers or sound transmitting de-

vices. Infra red rays may be passed through an ordinary photographic film or the film of a moving picture without interfering with the proper projection of the picture by moving picture projecting apparatus. If a film is prepared, therefore, having on one side the ordinary photographic reproductions of pictures, and on the other side a phonographic sound record, capable of being reproduced only by infra-red rays, the sound record will not interfere with the passage of white light to and through the pictures and the presence of the pictures will not interfere with the passage of infra-red rays through the strip. On one side of the film or the strip, therefore, would be the ordinary picture record and on the other side would be a printed photographic record of sound, which latter record would be transparent to ordinary visible light but would more or less intercept the infra-red rays to produce variations in the projection of these rays, these variations being used to affect sound transmitting apparatus as will be later stated. Infra-red rays are below the ordinary visible spectrum. They are invisible to the naked eye and are very penetrating and are subject to the same optical laws as ordinary light.

Many substances will cut off visible light entirely but will let the infra-red rays pass nearly perfectly. Vulcanite, iodin, bromin and many other substances will permit the passage of these infra-red rays and more or less completely intercept the visible rays. Many substances such as alum, cupric chlorid, water, oxygen, carbonic acid gas, very thin metallic silver and selenite will, on the contrary, permit the passage of visible or white light but will cut off more or less the passage of the infra-red rays.

Ordinary celluloid, of which material the moving picture film is usually constructed, is very transparent, both to the visible light rays and to the infra-red rays. By coating one side of a strip of celluloid, therefore, with a substance pervious to the white light rays and the other side with a translucent substance impervious to the infra-red rays, neither of the coatings would interfere with the passage of these rays and both records, the picture record and the sound record, could be combined on one film.

For the visible light picture record, there are many photographic prints (such as most any of the present forms of positive prints) which would interfere not at all with the passage of the infra-red rays, and it is therefore only necessary to provide a proper transparent coating on the strip or film which will intercept more or less the infra-red rays and yet will not affect the passage of the rays of white light.

One of the substances which would permit visible light to pass but which is opaque or impervious to the infra-red rays is very thin metallic silver, but I do not wish to be limited to this as any material which would cut off, intercept, destroy or reflect back the infra-red rays would be equally suitable. This would be done by any substance having a high percentage of water of crystallization or a high percentage of water of constitution, a high percentage of selective reflection, or a high percentage of selective absorption. This infra-red rays intercepting substance is to be combined with gelatin, as for instance, the gelatin of the film, this gelatin acting as or being a medium for carrying said substance and this medium being subject to the photographic action for obtaining the necessary sound record.

In Figs. 5, 6, 7 and 7ª I show a portion of a film or strip of moving pictures designed to be used in my invention, both for the purpose of taking the moving pictures and for the purpose of reproducing them. Fig. 7ª is an enlarged sectional view, as it may be termed, and in this figure, 2 designates the body of the film, 3 a coating upon which the photographic picture print is made or taken, and 4 a coating of a substance which is capable of being acted upon photographically by ordinary light, and which will act as a medium to carry a substance which will act to intercept either partially or entirely infra-red rays to thereby cause the reproduction of sound by electrical transmission devices. Fig. 5 shows the face view of the film, as it may be termed, with moving pictures thereon. Fig. 6 shows the reverse side of the film and illustrates diagrammatically the sound record as photographed upon the film. Fig. 7 illustrates the compound record and shows that the sound record extends entirely across the film and therefore underlies the picture record.

While in Figs. 6 and 7 the sound record is shown as being made up of lighter or heavier lines or parallel striations extending entirely across the strip from one edge to the other, it is possible to have one record to extend from one marginal edge to the middle of the strip and another record to extend from the middle of the strip to the marginal edge. Such a record is shown in Fig. 8 wherein 4ª indicates one sound record and 4ᵇ another sound record. The film shown in Fig. 8 is particularly adapted for use in a manner hereafter described.

It is, of course, necessary that the sound record and the picture record should be made simultaneously so that there will be complete synchronism between the sound record and the events shown by the pictures. In Figs. 2 and 3, 5 designates a double camera which will take moving pictures by means of the ordinary moving picture

camera mechanism and which is provided with a compartment 6 containing the photographic camera proper having a compartment 7 which contains what may be termed the sound camera mechanism for making a negative sound record.

Inasmuch as the mechanism used for taking the moving pictures is of the ordinary form, it requires no special description. This mechanism is actuated by means of the shaft 8 having the usual crank 9. The compartment 7 wherein the sound photographing mechanism is disposed, is preferably divided into an upper and a lower reel compartment in which are located respectively the reels 10 and 11. The film or strip 12 is fed down from the upper reel 10 over the rollers 13 and 14 to the lower reel, this lower reel being mounted upon the shaft 8 and being driven therefore synchronously with the picture apparatus. Immediately behind that portion of the film 12 between the rollers 13 and 14 is a diaphragm 15 having therein a narrow slit 16.

Behind the diaphragm 15 is disposed the tube 17 of a manometric flame apparatus. The flame 18 of this apparatus is disposed immediately in front of a mirror 19 whereby the rays of light are focused upon the film through the slit 16. When the film 12 is in position, there will therefore be a bright line of light thrown upon the face of the film. The manometric tube 17 extends down into a chamber 20 from which extends a gas pipe 21 leading to any suitable source of gas. Above the flame 18 is disposed a chimney 22 having baffle plates 23 therein, which chimney permits the outward passage of the products of combustion but prevents the flame 18 from being deflected by down drafts of air.

The front of the chamber 20 is provided with a diaphragm 24 and from this diaphragm there extends a megaphone 25 which as illustrated forms part of the camera body, this megaphone being of course enlarged at its forward or front end and gradually converging until it opens into the diaphragm chamber.

It is to be understood, of course, that the film used for taking the moving pictures is shifted intermittently by mechanism as ordinarily used in moving picture machines, while the film which is used for taking the sound record moves steadily and continuously. The film or strip 12 and the film or strip upon which the moving pictures are to be taken is the same as the ordinary negative moving picture films.

While I have illustrated a manometric flame for the purpose of photographically recording sound upon the film 12, I wish it understood that I may use a speaking arc in place of the manometric flame and that I do not wish to be limited to any particular apparatus for making this photographic sound record as it is obvious that many different forms of apparatus may be used for this purpose. The manometric flame apparatus is shown purely for purposes of illustration.

With the manometric flame apparatus, the operation of the camera is evident. The camera is intended to be used precisely the same as an ordinary moving picture camera. While the picture is being taken, the film of the picture taking apparatus moves intermittently as before stated while the film of the sound apparatus moves steadily. The vibrations of the air caused by the sound waves being recorded, affect the diaphragm in a way well understood, and this in turn affects the manometric flame. The variations of pressure in the manometric tube 17 will cause variations in the intensity of the flame and consequently variations in the rays of light passing through the slit 16. As a consequence a photographic record of the sound will be made upon the sensitized strip, this sound record showing the variations in intensity of the light just in proportion to the amplitude of the sound vibrations. The sound record shows in the developed negative film as alternately light and dark striations which while having the appearance of great irregularity, are in reality exceedingly regular and harmonic, only changing their order with the change in the sound vibrations of which they are a record.

The record so produced and above referred to is the same form of record as is used in the photographone of Ruhmer and the reproduction of speech or sound from such a photophonographic record has been found to be astonishingly clear and quite strong, much clearer and purer than the reproduction of the ordinary wax cylinder phonograph. From a photographic sound record as above described, it is possible to secure many reproductions, each of which will reproduce the original sounds with equal exactitude.

It will be noted from what has gone before that so far the negative of the sound record and the negative of the picture record have been made upon separate strips or films. It is necessary, therefore, that these two negatives should be photographically printed upon one film or upon opposite sides thereof. In printing these records, the picture record would be printed as usual on one side of the moving picture film and fixed, the fixing solution however not being allowed to touch the other side of the film or strip. On the other side of the film there is a coating 4 of the substance before referred to which is impervious or opaque to infra-red rays, one such substance being very thin metallic silver. This substance which is opaque or impervious to the infra-red

rays is combined with gelatin or other suitable medium. After the picture side of the film has been printed, this coating 4 is sensitized by brushing on a solution having a proper proportion of bichromate of potassium or bichromate of ammonium. This sensitizes the gelatin and makes its sensitive to light for photographic action. This coating 4 could not be sensitized previously as in printing the pictures the sensitiveness of the coating 4 to light would be destroyed. The gelatin medium wherein the thin metallic silver for instance is carried, would simply act to hold this metallic silver or like substance and act as a transparent medium subject to the photographic action of light to thereby obtain a photographic record of the sound variations or sound record. The sound record which has been taken as previously described would be printed on the coating 4 of the film shown in Figs. 5 to 7 by means of ordinary light, ordinary light affecting the now sensitized gelatin, and after printing in this manner the face 4 of the film is soaked in water which dissolves the gelatin that has not been acted on by the light. This soaking of the film will leave and take off horizontal stretches of transparent gelatin extending across the film, and therefore leave or cut off the element or substance carried in the gelatin and which acts to cut off the infra-red rays. The horizontal stretches or lines of gelatin left upon the side 4 of the film correspond to the sound record.

Thus on one side of the film 2 there would be a picture record to be reproduced by means of ordinary light, which light passes uninterruptedly through the clear transparent gelatin while on the other side would be the sound record formed by bands of gelatin corresponding to alternate light and dark lines on the negative and adapted to be reproduced by means of infra-red rays which would pass readily through the entire film except where purposely cut off by the substance impervious to red rays contained in the gelatin left upon the film. It is reiterated that the white light would be entirely unaffected by passage through the coating 4 and that the infra-red rays while being affected by the coating 4 would be unaffected by the coating 3 containing the picture record.

Generally speaking, for the reproduction of the picture record and the sound record, ordinary white light is passed through the picture record while infra-red rays (invisible to the eye) are passed through the sound record and fall upon suitable instruments to be hereafter described whereby these infra-red rays will cause the reproduction of sound vibrations. There are a number of instruments that are sensitive to infra-red rays. The tasimeter invented by Thomas A. Edison will measure heat accurately [illegible] to the ten-thousandth part of one degree but this instrument is probably too slugg[illegible] for the purpose of reproducing sound record. The selenium cell when sensitized by Abney's process is sensitive to infra-red rays and may be used for the purpose. I believe, however, that the bolometer is best adapted for the purpose for several reasons, but principally because the element [illegible] which the light falls can be made so nearly to coincide with the small horizontal lines of the photographic sound record [illegible] width of the horizontal lines of the sound record would be regulated according to the speed of the film. Thus for instance [illegible] the Urban-Smith natural color film is used, these horizontal lines would be [illegible] on account of the greater operating speed of these natural color films.

In the reproducing apparatus such as hereafter described, infra-red rays are projected against the film containing the sound record and the picture record by suitable prisms such as prisms of rock salt, fluorite or Jena glass and focused through a narrow slit onto the film and after passing through the film fall on the reproducing instrument such as the bolometer. Connected [illegible] with the bolometer or through similar apparatus would be loud-speaking phones such as the auristophone, the Edison or the Baldwin receret loud-speaking phones.

Moving pictures are reproduced by intermittently moving the film. It is therefore plain that it would be impossible to use this film during its intermittent motion or at the point through which the white light rays are projected for the purpose of reproducing the sound record, it being plain that the sound record must be reproduced [illegible] was taken, namely, by a continuous movement of the film. I overcome this difficulty therefore by passing the infra-red rays through the film at a point on one side of the other of the point where the picture projecting rays are passing through, that is, at a point where the film is moving continuously and steadily.

An apparatus whereby the moving pictures may be projected and the sound record synchronously reproduced, is illustrated in Fig. 1. This figure shows an ordinary moving picture projecting apparatus comprising a table or base 26 supported in any suitable manner and supporting upon it the lamp housing 27 wherein there is disposed the ordinary right angle arc lamp 28 such as used in moving picture machines. Such a right angle arc is particularly adapted as a source of infra-red rays while supplying at the same time the ordinary white light for the pictures. The light is projected from the lamp housing in any usual suitable manner onto the film 2. This [illegible]

unrolled from an upper film reel and passes down through the usual moving picture projector 29. This mechanism contains means for intermittently shifting the film while the shutter of the mechanism is closed. Inasmuch as there are various types of this mechanism and it is thoroughly well known, it is not deemed advisable to describe the mechanism in detail.

The white light after passing through the film 2 at the point *a*, is projected onto a screen A in the usual manner. The film after it passes below the aperture plate of the moving picture machine no longer moves intermittently but is moved continuously and I have illustrated the film 2 as being passed around a series of rollers 30 and in front of the aperture of a selenium cell or like apparatus, this cell being designated 31. After passing in front of the aperture of the selenium cell the film 2 passes around a lower or receiving reel 32 which may be connected up with any suitable mechanism whereby the reel may be rotated continuously in a direction to wind up the reel 2 at a suitable rate of speed.

Disposed immediately below and in line with the meeting point between the carbons of the angular arc lamp 28, there are series of lenses 33. These lenses are preferably made of rock salt or fluorite. The infra-red rays passing through these lenses 33 are transmitted by means of prisms 33ª of Jena glass or other suitable material to the aperture of the selenium cell 31. A diaphragm 34 is so disposed as to cause these rays to fall in the form of an elongated narrow or transversely extending beam upon the face of the selenium cell 31. Preferably the lenses 32 and the prisms 33ª are contained within a casing or housing 35.

The selenium cell 31 is formed in any usual or suitable manner and requires no particular description as it is the ordinary form of cell except that preferably the cell is treated by Abney's process so as to make it extremely sensitive to the infra-red rays. Mounted behind the screen or in any suitable portion of the exhibition hall is a loud-speaking phone designated 36 in Fig. 1. This is a loud-speaking electric telephone and is connected in series by the wires 37 with the selenium cell 31.

The operation of the picture and sound reproducing apparatus illustrated in Fig. 1 is of course obvious. The pictures are reproduced in the usual manner, but after the strip or film has passed beyond the specific moving picture mechanism, the strip passes in front of the selenium cell and the transverse bands or lines of the sound record on the film will act to more or less intercept, absorb, reflect or otherwise stop or impede the passage of the infra-red rays. Where the infra-red rays fall with full force upon the selenium cell, the cell will have a certain degree of electrical resistance. Where the infra-red rays are intercepted or their intensity changed in any manner, the electrical resistance of the selenium cell will vary correspondingly. There will therefore be a constant variation of the electrical resistance of the cell as the record film passes in front of the cell, and this continual variation of resistance will, in a manner well known, affect the mechanism of the telephone transmitter 36 and thereby cause vibrations of the air corresponding to the sound vibrations and the sound will be reproduced. All of the mechanism heretofore described is well known by itself. The photophone operates on the same principle as the sound reproducing mechanism heretofore described, but using ordinary white light.

Inasmuch as sound reproductions may be secured by a large variety of electrical apparatus, affected by variations of rays falling upon it, I do not wish to be limited to the use of a selenium cell or any other specific apparatus for the purpose of translating the photographic sound records into air vibrations as any other mechanism having the same general function may be substituted for the selenium cell.

For purposes of illustration, I have shown in Figs. 9 and 10 two other forms of mechanism adapted to translate the vibrations of light rays into sound. Fig. 9 illustrates the bolometer as used for this purpose. The bolometer will measure heat accurately down to the ten-millionth part of a degree. In Fig. 9 38 and 39 indicate two thin platinum strips forming the two arms of a Wheatstone bridge normally in perfect balance. The infra-red rays passing through the film 2 in the form of a thin beam fall on one of these arms or strips, namely the strip 39. This disturbs the balance of the bridge. This Wheatstone bridge is connected as illustrated in the diagram to a telephone transmitter 40 which is the transmitter of any one of the loud-speaking phones previously referred to. The current passing through this transmitter will vary in correspondence with the variations of the red rays falling upon the strip 39 and therefore the photographic sound record will be reproduced as air vibrations. The action of this instrument is virtually instantaneous in its operation and extremely sensitive.

Fig. 10 is a diagram of the Edison tasimeter which may also be used for the purpose of translating photographic sounds into sound vibrations. In this figure 41 illustrates a rod of vulcanite supported against a fixed abutment at one end and at the other end abutting against a movable disk 42. This disk bears in turn against a carbon button 43 disposed between the movable disk 42 and a fixed disk of metal 42ª. The

two metal disks 42 and 42ª are connected in circuit to a loud-speaking phone the current passing more or less between the disks 42 and 42ª through the carbon button as it is compressed. The variations in these red rays cause this vulcanite to contract and expand thus compressing the carbon button 43 between the metal pieces 42 and 42ª, causing variations in the current corresponding to the variations in the strength of the rays.

While I have illustrated three forms of electrical sound reproducing apparatus, I wish it understood that I may use other forms. Thus I might use a thermopile, especially a "Bi-Ag," a selenium cell made sensitive to infra-red rays by Abney's process, or any other delicate heat measuring instrument of like character.

While in Fig. 1 and Figs. 9 and 10 I have shown only one telephone transmitter, this transmitter being shown in Fig. 1 as being disposed behind the screen A, it will be understood that with the electrical sound reproducing apparatus I may use a plurality of telephone transmitters disposed at various portions of an amusement hall, not only behind the screen but at the sides of the hall. This is obviously of great advantage and is not possible where ordinary sound reproducing mechanism is used.

Such an arrangement of phones is illustrated in Fig. 4 wherein the picture and sound projecting apparatus is designated 47 and illustrated diagrammatically, the picture being received upon the screen 48. As illustrated, there are three loud-speaking telephone receivers 49 disposed behind the screen 48 and a plurality of loud-speaking transmitters disposed along the side of the hall and facing toward the audience. Thus the sound reproduced may be distinctly heard by everybody in the audience. While I have illustrated in Fig. 4 all of the phones as being connected in one circuit and as being actuated by one selenium cell, bolometer or tasimeter, it is to be understood that when a film like that shown in Fig. 8 is used with two records placed in parallel position upon the film, a plurality of sets of sound reproducing apparatus is to be used. Thus with the film shown in Fig. 8 there will be two beams of infra-red rays projected through the film, each falling upon a separate bolometer, tasimeter or like apparatus, and each such reproducing mechanism being electrically connected to one of a series of sets of phonographic transmitters. By using the film shown in Fig. 8, a dialogue may be reproduced so that the sounds will issue from transmitters set at opposite sides of the hall or at opposite points behind the screen, thus causing the dialogue to seem more natural than if it apparently issues from one point only. It is obvious that a larger number of records could be placed upon the same film and thus the sounds be caused to issue from a plurality of points behind the screen or around the hall.

The two main features of my invention upon which the invention is based are in the first place the provision of a film capable of receiving not only the photographic prints of the pictures to be projected, but also the photographic record of the sound and the use with these films of invisible rays for the purpose of reproducing the sound record. The other important and vital feature of my invention resides in the provision of means whereby the sound record may be taken from that portion of the film which is moving continuously while that part of the film through which the rays of white light are projected is moved intermittently.

In printing the sound record upon the strip or film 2, the sound record is started a sufficient distance beyond the starting point of the picture record so that at the instant that any one event is being projected on the line x, the sound record corresponding to this event is passing the axis of line Z. Inasmuch as in taking or making the picture record and the sound record two separate negative films or strips are used, it is entirely possible in printing these records upon the film 2ª to displace the sound record with relation to the picture record in the manner stated. While I have shown the axis Z of the infra-red beam as being about twelve inches below the axis x of the white light beam, I wish it understood that the two axes may be much nearer than this and that the drawing in Fig. 1 is purely illustrative in this regard, and further that I may pass the infra-red rays through the strip 2ª above the picture projecting mechanism and above the axis x.

While I have referred to the lenses and prisms for focusing and transmitting the invisible rays as being made of rock salt, or Jena glass, it is of course obvious that they may be made of other material such as fluorite, or that I may use metallic reflectors for deflecting the invisible rays along the line Z.

By using a film having thereon a plurality of sound records, great naturalness could be secured as before stated by the fact that the transmitters translating the variations in the sound record into sound vibrations, could be located nearer to or farther from the inner side of the screen, or could be located on opposite lateral sides of the screen or stage so that the voices will apparently be projected in accordance with the positions of the actors in the moving picture. It is obvious also that in place of using a camera having a megaphone for transmitting sounds to the "speaking arc" or the manometric flame, sensitive microphone

transmitters might be used at various portions of a stage upon which actors were acting a moving picture play, and that the vibrations of these microphones could be transmitted electrically to diaphragms placed within a camera to thereby transmit the sounds proceeding from the several microphones to the several flames or speaking arcs to be recorded in separate columns upon the sound record film.

In Fig. 11 I show diagrammatically a "Bi-Ag" thermopile as above referred to. As this thermopile is well-known an extended description is not necessary. The thermopile consists of a frame 50 having an opening at its middle and extending across this opening are a plurality of couples 52 composed of connected bismuth and silver wires. These couples are joined by overlapping plates of tin, the junctions formed by the plates being covered with platinum black. The frame 50 with its couples of platinum and silver is supported inside of a casing 51 having a narrow slit through which the infra-red rays are projected upon the junction plates. The couples of silver and bismuth are connected in circuit with a receiver of a loud-speaking telephone in the manner heretofore described. A thermopile of this character is fully described in Bulletin No. 4 issued by the Bureau of Standards on Instruments and Methods of Radiometry. Therefore no extended description of the thermopile is necessary.

In case the talking picture machine before described is desired to be used in very large theaters where it would take a sound a perceptible time to travel the distance and where it would be possible to see the picture, therefore, before hearing its corresponding sound, the following arrangement could be made. After the system has been brought to a standard the instrument sensitive to the infra-red rays would always be just a certain distance from the lens or just a certain number of pictures below the lens. In a large theater, therefore, it would be only necessary to slightly advance the instrument, that is, move it a bit nearer to the lens, in which case the sound of a given event would slightly precede the picture but the sound would reach the observer at the same time that the picture was shown.

What I claim is:

1. A composite picture and sound recording film having on one side thereof a series of consecutive picture records and on the other side thereof a corresponding photographic sound record, the records being in overlapped relation.

2. A composite picture and sound recording film having on one side a series of consecutive pictures formed to permit the passage of invisible light rays without affecting said rays and on the other side thereof a corresponding photographic sound record formed to permit the passage of visible rays but to intercept or affect the passage of invisible rays, the records being in overlapped relation.

3. A composite picture and sound recording film having in conjunction a series of consecutive pictures adapted to permit the passage of invisible light rays and having in conjunction therewith a corresponding photographic sound record adapted to permit the passage of invisible light rays, the records being in overlapped relation.

4. A composite picture and sound recording film having on one side a series of consecutive pictures adapted to permit or affect the passage of visible rays of white light and having on the other side and superposed upon the pictures a corresponding photographic sound record adapted to permit the free passage of rays of visible light but to intercept or affect the passage of rays of invisible light.

5. A composite picture and sound recording film having thereon a series of consecutive pictures adapted to affect or intercept the passage of rays of visible light and on the other side a corresponding photographic sound record adapted to intercept or affect the passage of infra-red rays, the records being in overlapped relation.

6. A composite picture and sound recording film for moving picture talking machines, of transparent material having on one side a picture record affecting rays of ordinary visible light but not affecting invisible light rays and on the other side a sound record permitting the passage of ordinary visible light but affecting or intercepting the passage of invisible light rays, the records being in overlapped relation.

7. A composite picture and sound recording film for moving picture talking machines having on one side a series of consecutive pictures intercepting or affecting the passage of white and visible light and having on the other side and extending entirely across the film a photographic sound record formed of a substance permitting the free passage of ordinary white light rays but affecting or intercepting the passage of invisible light rays.

8. A sound recording film having thereon a photographic medium and a medium adapted to cut off, intercept or otherwise affect rays of invisible light, the mediums being in overlapped relation.

9. A sound recording film having thereon a photographic sound record composed of a substance having a high percentage of water of crystallization or a high percentage of water of constitution, a high percentage of selective reflection or a high percentage of selective absorption.

10. A photographic sound record com-

prising a transparent film having thereon a sensitive coating comprising a substance having a high percentage of water of crystallization or a high percentage of water of constitution, a high percentage of selective reflection or a high percentage of selective absorption, and a medium carrying said substance and subject to the photographic action whereby the sound records may be photographically obtained.

11. A sound reproducing and moving picture film of material transparent to visible and invisible light having on one side a picture record and on the other side a photographic sound record, the picture record being of material permitting the free passage of light rays beyond or below the visible spectrum but intercepting or affecting light rays proceeding within the visible spectrum, the sound record being formed of material permitting the free passage of visible light rays but affecting or intercepting the passage of rays beyond the visible light spectrum, the records being in overlapped relation.

12. The method of producing a motion picture and sounds corresponding to the action of the pictures which consists in passing rays of visible light and invisible light rays separately through a film, one side of said film being provided with photographic picture records acting to affect rays of visible light but not affecting invisible light rays, the other side of said film having superimposed thereon a photographic sound record of a substance which will affect invisible light rays but will not affect the visible light rays, causing the film to move at one point intermittently and at another point continuously, causing the rays of visible light to pass through the intermittently moving portion of the film and the invisible rays to pass through the steadily moving portion of the film, and translating the variations in the invisible light rays into sound vibrations.

13. A film for use in reproducing pictures and sound in synchronism having thereon a plurality of photographic records, each adapted to intercept or affect a certain class of light rays and permit rays of another class to pass unimpeded therethrough, each record intercepting or affecting that class of light rays which is permitted by the other record to pass freely, the records being in overlapped relation.

14. A film for use in reproducing pictures and sound in synchronism having thereon a plurality of superimposed photographic records, each adapted to intercept or affect a certain class of light rays and permit rays of another class to pass unimpeded therethrough, each record intercepting or affecting that class of light rays which is permitted by the other record to pass freely, the records being in overlapped relation.

15. The method of reproducing a plurality of different records from a single moving film, consisting in moving a film across the paths of a plurality of different classes of light rays, said film having thereon a plurality of superposed records, each of said records affecting or being more or less opaque to the passage of a certain class of light rays but permitting the free passage of another class of light rays, the rays permitted to pass by one record being of another set or class from those permitted to pass by any other record.

16. A composite picture and sound recording film having on one side thereof a photographic record and on the other side a photographonic record, the records being overlapped.

17. A composite picture and sound recording film having opposed photographic and transparent photographonic records.

18. A composite picture and sound recording film having opposed surfaces sensitized for the individual impression thereon of photographic and photographonic records.

19. A negative film for the negative impression of picture and sound records having its opposed surfaces sensitized one for the photographic impression of a picture and the other sensitized for the photographonic impression of a related sound, the sensitized medium of the last-mentioned surface of the film being pervious to visible light rays.

20. A positive film for the reproduction of picture and sound records having upon one surface a positive picture record pervious to invisible light rays and provided upon its other surface and directly opposite the picture record with a positive sound record pervious to visible light rays and more or less impervious to invisible light rays.

In testimony whereof I affix my signature in presence of two witnesses.

RICHARD M. CRAIG. [L. S.]

Witnesses:
G. M. Book,
G. H. Shiner.

O. MESSTER.

METHOD OF EXHIBITING THE MOVEMENTS OF ORCHESTRA CONDUCTORS.

APPLICATION FILED MAR. 25, 1914.

1,286,383. Patented Dec. 3, 1918.

Fig. 1.

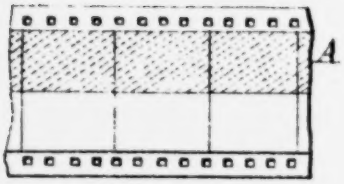

Fig. 2.

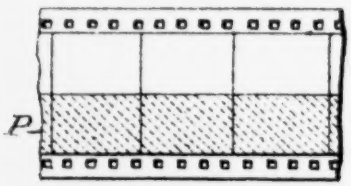

Fig. 3.

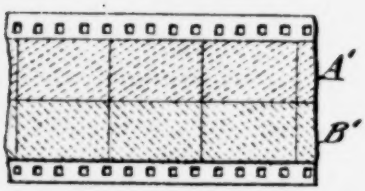

Fig. 4.

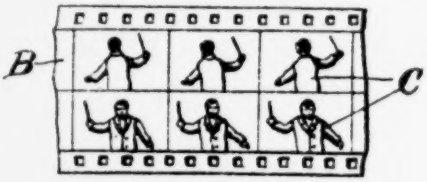

Fig. 4a

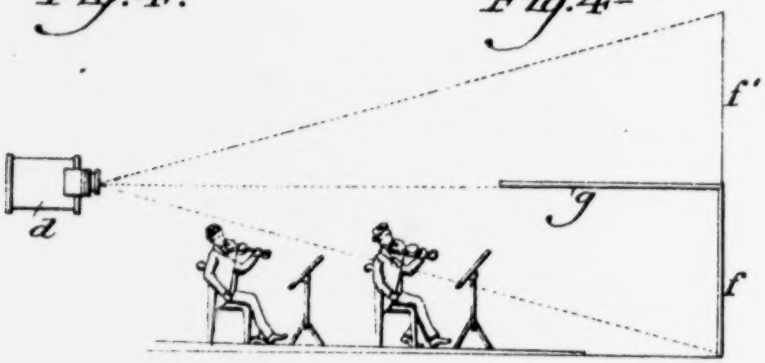

Fig. 5.

INVENTOR

Oskar Messter

BY Wiedersheim & Fairbanks.

ATTORNEYS

UNITED STATES PATENT OFFICE.

OSKAR MESSTER, OF BERLIN, GERMANY.

METHOD OF EXHIBITING THE MOVEMENTS OF ORCHESTRA CONDUCTORS.

1,286,383. Specification of Letters Patent. Patented Dec. 3, 1918.

Application filed March 25, 1914. Serial No. 827,023.

To all whom it may concern:

Be it known that I, OSKAR MESSTER, a German subject, residing in Berlin, No. 32 Blücherstrasse, Germany, have invented new and useful Improvements in Methods of Exhibiting the Movements of Orchestra Conductors, of which the following is a specification.

The subject of my invention is a method of conducting an orchestra without a conductor being present in person.

My invention consists, broadly, in replacing the person of the conductor by cinematographic representation so that the musicians as well as the hearers will see the so represented conductor as he would appear when personally present, that is the cinematographic representations shall be such that the represented conductor will have his back to the audience and his face to the orchestra, thereby rendering the exhibition more realistic.

This is necessary in order that the same effect be obtained as the conductor in person produces in concert rooms. The invention is important for the reproduction of the art of conducting possessed by famous conductors, such art thus being enabled to be communicated to the remotest posterity. In a concert room my new method will insure a perfectly esthetic impression on the audience, as the conductor will be represented at the usual place and in the usual manner, that is, with his back to them so that they will not be influenced by the expression of his face. The musicians also will see him at the usual place and recognize at the picture the tempo indicated by the conductor and the signals given by him for striking-in, intonation, &c.

An artistic moment will particularly be produced by the picture showing the expression of the conductor's face in the same manner as if he were personally present, a suggestive influence on the musicians being thus brought about to affect their playing. The members of the orchestra can, therefore, play in accordance with the conductor's individual interpretation of the tempo, the dynamical modulation and the color of tone being produced in accordance with his interpretation.

My invention will be fully understood from the accompanying drawing in which—

Figure 1 is a diagrammatic plan of an arrangement adapted for producing the films provided with the pictures of an orchestra conductor; Figs. 2, 3, and 4 are diagrammatic views of a film thus produced and shown in different stages of completion; Fig. 4^a represents the film ready for use; Fig. 5 is a diagrammatic elevation of an arrangement for projecting the films thus obtained.

As shown in Fig. 1, the conductor, indicated at *a*, is cinematographically taken in front and back views simultaneously, by means of two cinematographs *b*, b^1 driven synchronously. Both cinematographs are to be covered by screens *c*, c^1, in order that they do not appear in the pictures produced. Their objectives, however, must remain uncovered for obvious reasons.

A film is used for each cinematograph and is passed in a horizontal direction therethrough, the pictures produced on it taking up half the width thereof, as shown in Figs. 2 and 3. Two rows of pictures, A and B, will thus be obtained, which are then so copied, by means of a well-known process, that a film having two adjacent rows of pictures A^1, B^1 will result, as shown in Fig. 4. One of such rows of pictures comprises the back representations of the conductor, the other row the front representations, the individual pictures, produced synchronously as stated, being so disposed on the film shown in Fig. 4 that beside each back picture there is the appertaining front picture of the conductor. In Fig. 4^a, the film is portrayed as being ready for use, B designating the body of the film and C designating the different positions of the conductor.

In order to show the pictures to the audience and musicians in the correct positions, one of the cinematographic productions must be made by means of a reflector or the like.

On reproduction the two rows of pictures are, by means of a cinematograph *d* disposed in the orchestra room, so projected on a projection wall D, one of them lying below the other, that on the lower portion *f* of this wall the pictures of that row will appear which comprises the front representations of the conductor, and the conductor will apparently appear as usual to the members of the orchestra arranged in a suitable or convenient manner below the screen *g*. To this end the film illustrated at Fig. 4 is passed in a horizontal direction through the apparatus. The portion *f* of that portion of the projection wall D is not transparent,

and consequently the audience will not see the row of the pictures comprising the front representations of the conductor. The upper portion f^1 of the wall D is translucent, so that the audience will see the pictures of the upper row which comprises the back representations of the conductor.

The screen g is disposed horizontally or nearly so, so that the pictures of the upper row, which are to be shown to the audience only, are rendered invisible to the musicians and cannot disturb them therefore.

The front and back representations of the conductor can also be produced immediately beside each other on the same film, by the use of particular reflectors and of only one cinematograph; then a positive film may be obtained by copying and be exhibited in the manner described. Two separate apparatus could also be used to exhibit each a row of pictures. In such case one of the cinematographs is behind the audience and is employed to reproduce the back representations of the conductor, while the other cinematograph, again placed in the orchestra room, is merely used to show his front representations. In such case, of course, both cinematographs must be moved synchronously, and the portion f^1 of the wall D is not translucent. For such a projection the pictures produced may take up the whole width of each film. In order to observe exactly the tempo indicated by the conductor it will be necessary that the apparatus used for taking the pictures and those employed for the reproduction thereof be fitted with a device which will insure a perfectly equal motion of these apparatus. Recording tachometers may preferably be used to such end, or the apparatus may be connected to a needle instrument which is to continuously correspond to the motion of the seconds hand of a clock during the said production and reproduction. The taking of the pictures is of course to be repeated if such indicating devices show differences as regards velocity.

It is to be understood that my invention is in no wise restricted to the embodiments illustrated or referred to, but that modifications may be made within the scope indicated by the appended claims, without departing from the spirit or sacrificing any of the advantages of this invention.

What I claim is:—

1. The method of exhibiting the movements of an orchestra conductor, which consists in first producing front and back cinematographic representations of the conductor, and then simultaneously exhibiting the front representations to the orchestra and the back representations to the audience.

2. The method of exhibiting the movements of an orchestra conductor, which consists in first simultaneously producing front and back cinematographic representations of the conductor, and then simultaneously exhibiting the front representations to the orchestra and the back representations to the audience.

In witness whereof I have hereunto signed my name this twenty-sixth day of February, 1914, in the presence of two subscribing witnesses.

OSKAR MESSTER.

Witnesses:

HENRY HASPER,

WOLDEMAR HAUPT.

April 8, 1924.

1,489,314

L. DE FOREST

RECORDING SOUND

Filed July 16, 1921

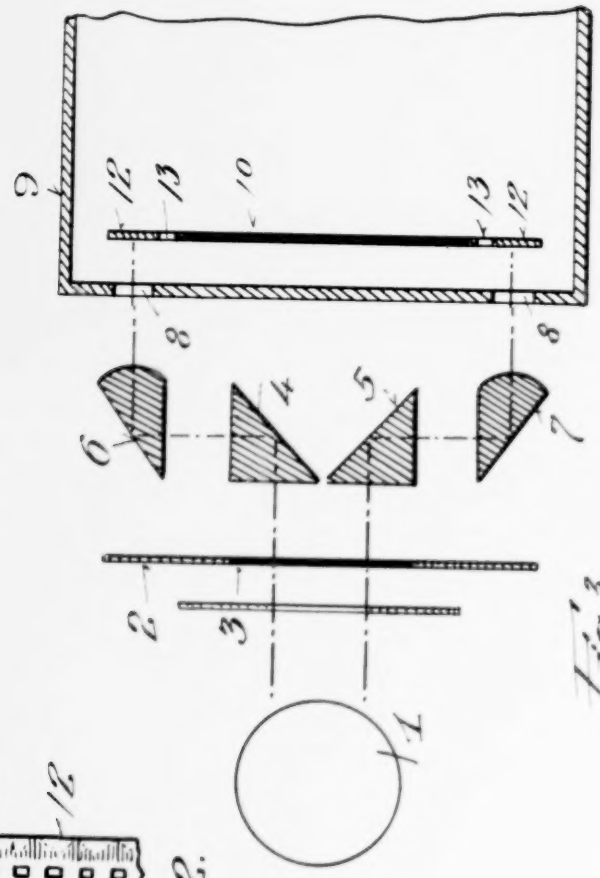

Fig. 3.

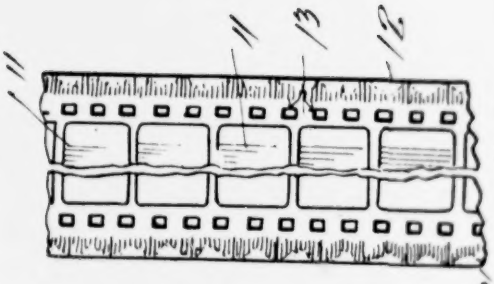

Fig. 2.

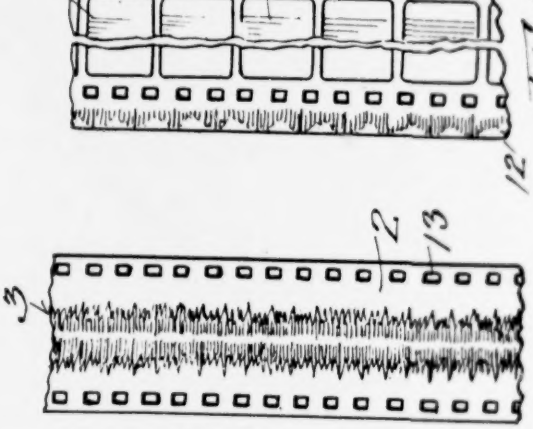

Fig. 1.

INVENTOR

Lee de Forest

BY his ATTORNEYS Darby & Darby

Patented Apr. 8, 1924. 1,489,314

UNITED STATES PATENT OFFICE.

LEE DE FOREST, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO DE FOREST PHONOFILM CORPORATION, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF DELAWARE.

RECORDING SOUND.

Application filed July 16, 1921. Serial No. 485,332.

To all whom it may concern:

Be it known that I, LEE DE FOREST, a citizen of the United States, residing in the city of New York, county and State of New York, have made a certain new and useful Invention in the Art of Recording Sound, of which the following is a specification.

This invention relates generically to the art of recording sound and more specifically where such record is obtained photographically for use in connection with photographic sound records such as films or the like, and is especially adaptable for use in connection with the art of motion picture photography.

The object of the invention is to provide means which are simple, economical and efficient for photographing sound record on films.

A further object of the invention is to provide means which are highly effective for accurately recording sounds on the marginal edges of a standard motion picture film.

Further objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location and relative arrangement of parts and the method employed in connection therewith, all as will be more fully hereinafter set forth, as shown by the accompanying drawing and finally pointed out in the appended claims.

Figure 1 is a fragmentary view of a sound record embodying the principles of my invention.

Fig. 2 is a similar view showing the sound record applied to the marginal edge of the motion picture film in accordance with my invention.

Fig. 3 is a diagrammatic view illustrating the principle involved in recording the sound waves photographically, in accordance my invention, on the marginal edge of a standard motion picture film.

The same part is designated by the same reference character wherever it occurs through the several views.

In my co-pending application, Serial No. 391,705, filed June 25, 1920, I show and describe methods for photographing sound-inside the intermittent feed perforations of the said film.

I find that if the original photographs of such sound-controlled light fluctuations be made large so that the width of the maximum amplitude of such photographic track be, say one-half inch or more, a more exact and faithful photograph containing any details of the finest light variations produced by sound waves will be obtained. For use as a sound record per se this type of record is satisfactory, but as is readily apparent it would be too large a record to use in connection with a motion picture film unless used independently therefrom and therefore necessitating the various problems of synchronism which have always been considered, and still are considered to be the objectionable problems in this art. In accordance with my invention, however, I produce the large, accurate and definite sound record on a film, for example, as shown in Fig. 1, and therewith reduce photographically the record thus obtained and print the same on one or both marginal edges of the motion picture film as shown in Fig. 2.

In the production of the photographic sound record of Fig. 1 it will be observed that the record is symmetrical on both sides of the axis thereof and it will readily be apparent that a highly effective and efficient record can be obtained by photographing the record contained on opposite sides of the axis thereof, on the marginal edge. This is accomplished, in accordance with my invention, in the manner illustrated in Fig. 3 wherein the sound record film 2 containing thereon the sound record 3 is passed between a light source 1 and 2 and prisms 4 and 5 so arranged that the sound record on one side of the axis of the film 2 is reflected in one direction and the record on the other side of the film is reflected in the opposite direction by means of the prisms 4 and 5. It will, of course, be understood that it is the light rays affected by the sound record 3 that are reflected by the respective prisms 4 and 5. The reflected light rays are again reflected by prisms 6 and 7 to direct the same in parallel lines through orifices 8 in the casing 9

April 8, 1924. 1,489,314

L. DE FOREST

RECORDING SOUND

Filed July 16, 1921

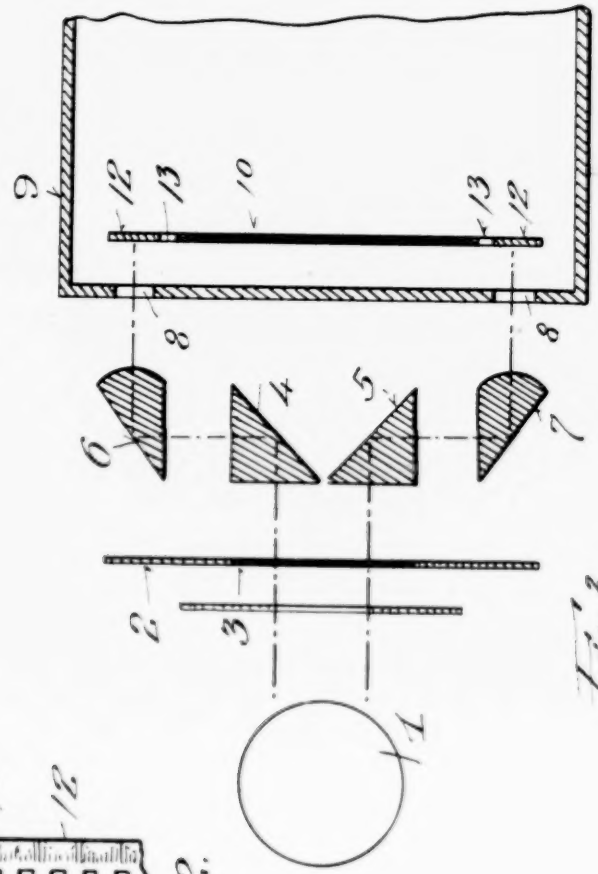

Fig. 3.

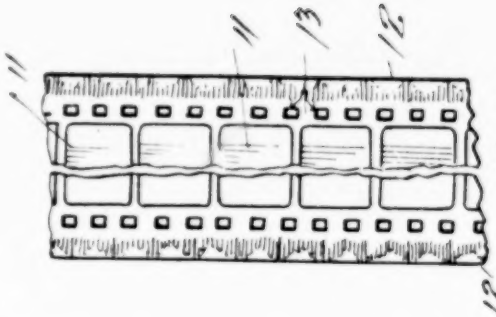

Fig. 2.

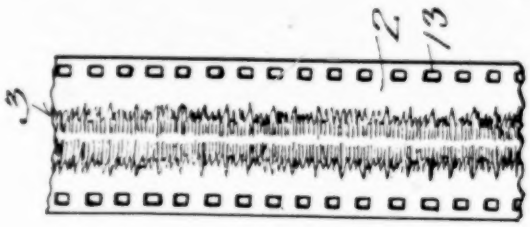

Fig. 1.

INVENTOR

Lee de Forest

BY his ATTORNEYS Darby & Darby

Patented Apr. 8, 1924.

UNITED STATES PATENT OFFICE.

LEE DE FOREST, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO DE FOREST PHONOFILM CORPORATION, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF DELAWARE.

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The same part is designated by the same reference character wherever it occurs through the several views.

In my co-pending application, Serial No. 391,705, filed June 25, 1920, I show and describe methods for photographing sound-produced fluctuations of a source of light upon one or both margins of a standard motion picture film either outside or directly inside the intermittent feed perforations of the said film.

I find that if the original photographs of such sound-controlled light fluctuations be made large so that the width of the maximum amplitude of such photographic track be, say one-half inch or more, a more exact and faithful photograph containing any details of the finest light variations produced by sound waves will be obtained. For use as a sound record per se this type of record is satisfactory, but as is readily apparent it would be too large a record to use in connection with a motion picture film unless used independently therefrom and therefore necessitating the various problems of synchronism which have always been considered, and still are considered to be the objectionable problems in this art. In accordance with my invention, however, I produce the large, accurate and definite sound record on a film, for example, as shown in Fig. 1, and therewith reduce photographically the record thus obtained and print the same on one or both marginal edges of the motion picture film as shown in Fig. 2.

In the production of the photographic sound record of Fig. 1 it will be observed that the record is symmetrical on both sides of the axis thereof and it will readily be apparent that a highly effective and efficient record can be obtained by photographing the record contained on opposite sides of the axis thereof, on the marginal edge. This is accomplished, in accordance with my invention, in the manner illustrated in Fig. 3 wherein the sound record film 2 containing thereon the sound record 3 is passed between a light source 1 and 2 and prisms 4 and 5 so arranged that the sound record on one side of the axis of the film 2 is reflected in one direction and the record on the other side of the film is reflected in the opposite direction by means of the prisms 4 and 5. It will, of course, be understood that it is the light rays affected by the sound record 3 that are reflected by the respective prisms 4 and 5. The reflected light rays are again reflected by prisms 6 and 7 to direct the same in parallel lines through orifices 8 in the casing 9, in which the motion picture film 10, either exposed as to the picture spacing 11 thereof and unexposed as to the marginal edge

thereof or unexposed as to its entire surface, is located. Means are provided to reduce, in size, the sound record 3 contained on its film 2, to the necessary size to be accurately and completely recorded on the marginal edges 12 of the film 10. This means may comprise suitable lenses or preferably a combination of a convex lens with the prisms 6 and 7, as shown. By means of this arrangement it will readily be apparent to those skilled in the art that the large, clear, distinct sound record 3 contained on its film 2 may be accurately reproduced in smaller, but nevertheless complete detail on one or both marginal edges 12 of the motion picture film, to thereby enable utilization of the space of the film contained between the intermediate feed perforations 13, and the edge or edges thereof.

It will also be readily apparent to those skilled in the art that by suitable location of the prisms 4, 5, 6, 7, and the orifices 8 of the casing 9, the reproduction of the sound record may be effected on any other desired part of the film. By suitable variation in the form of the prisms 6 and 7, or the utilization of suitable lenses, the original sound record may be reduced in size, reproduced as of the same size or enlarged, as desired.

Many other modifications and changes in details will occur to those skilled in the art without departing from the spirit and scope of my invention as defined in the claims, but having now set forth the objects and nature of my invention, and having shown and described structures embodying the principles thereof and illustrating the method employed in accordance therewith, what I claim as new and useful, and of my own invention, and desire to secure by Letters Patent, is:—

1. The method of producing talking moving pictures on the same film which comprises photographing simultaneously upon separate films the picture and the sound, and photographing the sound record on an unexposed portion of the picture film.

2. The method of producing talking moving pictures on the same film which comprises photographing simultaneously upon separate films the picture and the sound, reducing the size of the record, and photographing the reduced sound record upon an unexposed portion of the picture film.

3. The method of producing talking moving pictures on the same film which comprises photographing simultaneously upon separate films the picture and the sound, and photographing the sound record on an unexposed portion of the picture film between the marginal edge and the sprocket perforations thereof.

4. The method of producing talking moving pictures on the same film which comprises photographing simultaneously upon separate films the picture and the sound, reducing the size of the record, and photographing the reduced sound record upon an unexposed portion of the picture film between the marginal edge and the feed sprocket perforations thereof.

In testimony whereof I have hereunto set my hand on this 14th day of July, A. D. 1921.

LEE DE FOREST.

[Second Edition.]

N° 21,467 A.D. 1909

(Under International Convention.)

Date claimed for Patent under Patents and Designs Act, 1907, being date of first Foreign Application (in Italy), 7th June, 1909

Date of Application (in the United Kingdom), 20th Sept., 1909

Accepted, 24th Feb., 1910

COMPLETE SPECIFICATION.

Improvements in or relating to Cinematograph Films.

I, CARLO ROSSI, Manufacturer, of Via Madama Cristina, 85, Turin, Italy, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a cinematograph film on which two or more scenes are reproduced, and to the means for printing the same.

It has already been proposed to arrange on cinematograph films the photograms with their height perpendicular to the axis of the film, and it is also known to arrange two or more series of photograms on one and the same film, but there is a difficulty in using such multiple films owing to the very reduced size of the photogram if the film is to retain its ordinary width (*i.e.* 25 mm. of useful width).

On the contrary, according to this invention it is possible to obtain, on a film of ordinary width, two scenes allowing a very good projection with the screens generally used, because the photograms are arranged with their height normal to the axis of the film, that is succeeding each other at the side of each other instead of at the base of each other, as it is done at present.

In such a way the photograms result having a height of $12\frac{1}{2}$ mm., and a width of 19 mm., with the advantage that ordinary apparatus can be used with a film of this kind for taking views, and for printing and projecting the ordinary films, because each step of intermittent feeding movement of the film is, as at present, of 19 mm.

It is thus possible to obtain a positive film on which two different scenes are obtained, one for each series of photograms succeeding each other at the side of each other for the purpose of reducing the cost of each scene, whilst keeping the present width of the film, which is the most suitable width for its manipulation.

For this purpose a negative of the scene is to be taken, by an object glass having a diameter adapted to give a height to the photograms which is a fraction of the useful width of the film and by means of that negative the positive film is printed by contact, on which the series of photograms constituting the scene will occupy a corresponding fraction of the width of the film, whilst on the free portion of the said positive film another scene or scenes will be subsequently printed by means of other negatives.

In that way, the length of the negative film required would be the same as at present, but on one and the same length of positive film two or more scenes can be obtained instead of one only.

It is also possible to utilise an ordinary negative film, that is to say, having its photograms with the height in the direction of the axis of the film, the photograms having then to be printed on the positive film with their height in the direction perpendicular to the axis of the film and of a width corresponding only to a fraction of the useful width of the film, the printing cannot be done by contact, but it is necessary either to advance, in the apparatus for printing, the negative and the positive films in directions perpendicular to each other, with the interposition of a device for reducing the size of the images, or to advance the negative and positive films in parallel directions with the interposition of a device for reducing the images and turning them round their centre to an angle of 90°.

In both cases, a complete scene will be printed first for instance on the upper half of the positive film, and afterwards another different scene will be printed on the lower half of the same film, in such manner that the photograms will succeed each other at the side of each other in the same or in opposite directions in both scenes. In the latter case, the images of the photograms of the two different series will be reversed, and the second scene will be projected the film being reversed in the apparatus.

In the accompanying drawings:—

Figure 1 shows a negative film, with an impression only on the upper half by means of which the upper half of a positive film can be printed;

Figure 2 shows a negative film with an impression only on the lower half;

Figure 3 shows the positive film printed by means of the two preceding negative films.

Figures 4 and 5 show two methods of printing a scene on the half of a positive film by means of an ordinary negative; and

Figure 6 shows a positive film on which the different scenes proceed in opposite directions.

It will be understood that, in order to obtain the film shown in Figure 3, the two negative films shown in Figures 1 and 2 can be printed one after another, whilst in order to obtain the film shown in Figure 6, two negative films with an impression on the upper half of both of them could be utilised by reversing the positive film so that the printing on the lower half could be effected.

According to the method shown in Figure 4, two ordinary negative films are successively printed on one and the same positive film, it is only necessary to advance the negative film *a* vertically and the positive film *b* horizontally, with the interposition of a device for reducing the size of the photograms, each series of which has to occupy only half the width of the positive film.

According to the method shown in Figure 5, the negative film *a* and the positive film *b* advance parallel to each other in the same or in opposite directions. It is required in this case to arrange between the two films an object glass *c* for reducing the size of the image, and provided with a system of prisms *d* for turning them round their centre to an angle of 90°.

In the case of the film according to Figure 3, in order to project the scene occupying the lower half of the film, after the projection of the other scene, it is necessary to bring the projecting object glass, which was in the position I (see Figure 3), into the position II, whilst in the case of a film according to Figure 6, the object glass will not be touched, and the position of the film will be reversed.

With the film according to the Figure 6, there is the advantage that, during the projection of two different scenes, the film must advance in opposite directions, so that the perforations wear out on one edge as well as on the opposite one, that is to say, the perforations wear out in the same way as do in the ordinary films carrying a single scene.

There is the further advantage that the film has not to be wound again for

bringing to the outside the end which was inside the spool after the projection (as it is done at present) but it will suffice to reverse the spool before commencing the projection of the second scene.

The other conditions of manipulation and of wear being equals, there is the advantage of obtaining with one and the same surface of positive film two scenes instead of only one.

During the projection, the film could be advanced horizontally or vertically, the images being turned round their centre by means of prisms or other suitable arrangements.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A multiple cinematograph film in which two or more series of photograms are arranged with their height perpendicular of the axis of the film, the several series of photograms bearing different scenes and being uniformly arranged with regard to each other, or inverted.

2. A method of printing a multiple cinematograph film of the kind set forth in Claim 1, consisting in obtaining a negative film with an impression only on a fraction of its width corresponding to the fracton of width of the film on which the scene is to be reproduced the printing being effected by contact, whilst the other portion of the film will be occupied by other scenes printed in the same manner by other negative films with only a partial impression.

3. A method of printing a multiple film of the kind set forth in Claim 1, consisting in using ordinary negative films, the negative and the positive films being caused to advance in the machine, so as to obtain positive photograms arranged with their height perpendicular to the axis of the positive film, and of such size as to occupy only a fraction of the useful width of the said film.

4. A method of printing a multiple film of the kind set forth in Claim 1, consisting in using ordinary negative films, the negative and the positive films advancing in the machine for printing, in parallel directions, with interposition of a system for reducing and erecting the images, for the purpose of obtaining on the positive film photograms arranged with their height perpendicular to the axis of the film and of such size as to occupy only a portion of the useful width of the posit ve film.

Dated this 18th day of September, 1909.

BOULT, WADE & TENNANT.
111/112, Hatton Garden, London, E.C.,
Chartered Patent Agents.

A.D. 1909 Sep. 20. N° 21,467.

ROSSI'S Complete Specification.

(2nd Edition)

Fig. 1

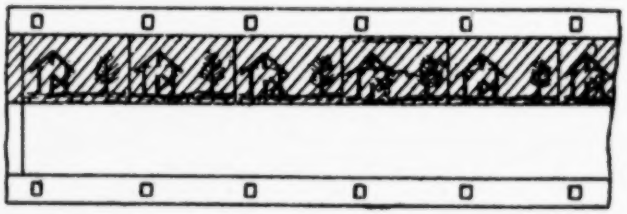


Fig. 2

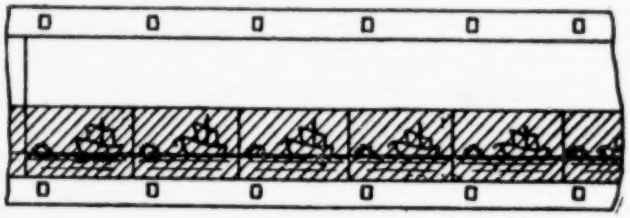


Fig. 3

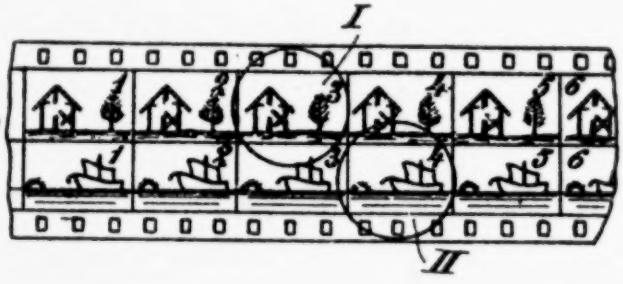


Fig. 4

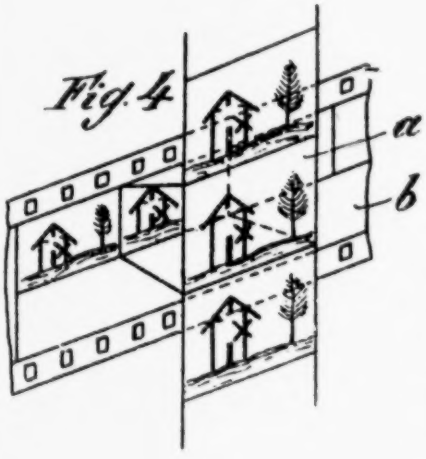


Fig. 5

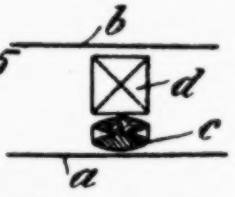
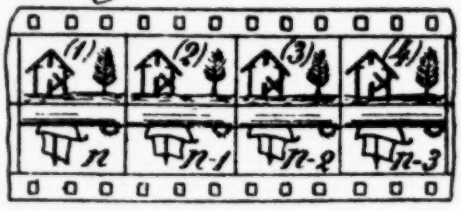


Fig. 6



[This Drawing is a reproduction of the Original on a reduced scale]

Malby & Sons Photo Litho

[Fourth Edition.]

N 23,620 A.D. 1911

Date of Application, 25th Oct., 1911.

Complete Specification Left, 25th Apr., 1912—Accepted, 24th Oct., 1912.

PROVISIONAL SPECIFICATION.

Improved Means of Simultaneously Recording or Reproducing Sound and Visible Movements Accompanying such Sounds.

I, AUGUSTUS ROSENBERG, of 259, High Holborn, London, W.C., Engineer, do hereby declare the nature of this invention to be as follows :—

My invention relates to a system of phono-kinematography, that is to say a method and means whereby on the one hand to obtain, together with a kinematographic record of the visual appearance of a continuous train of incidents, a record of the sounds accompanying said incidents, and whereby on the other hand to effect the scenic simulation of reality by the presentation, along with a kinematographic reproduction of such visual appearance, of an auditory reproduction of the sounds recorded.

The perfection of the result attained is primarily dependent upon absolute synchronism and correct registration between the kinematographic reproduction of the actions recorded and the auditory reproduction of the sounds which accompanied those actions : such synchronism, again, necessitating the sound-record being obtained simultaneously with the picture-record. The completeness of the illusion is, further, dependent upon the communication to the spectator of an impression of constant coincidence between the actual and the visually-apparent sources of the sounds as reproduced. Moreover, the successful representation of scenes or incidents occupying any considerable extent of ground or floor area involves the recording of sounds emitted at all parts of the space wherein the action takes place, so that (for example) a speaker or singer shall not be under the necessity of remaining in close proximity to (or otherwise in some narrowly restricted position or attitude with reference to) any device which may be employed for the purpose of picking up and transmitting to the recording instrumentality the words uttered or sung.

In describing my invention, which has for its object to provide a method and means whereby these ends may be attained, I will first deal more particularly with the maintenance of proper synchronism and registration between the visual and auditory reproductions, or in other words between the movements exhibited upon the kinematograph screen and the sounds emitted concurrently therewith.

It is well known that both picture-records and sound-records are obtained by causing an appropriate medium to travel during the recording operation past the point whereat such medium is exposed to the action of (or of the influence transmitted by) the recording instrumentality. Conversely, reproduction is effected by causing a medium bearing the record (which may be either the original record or some appropriate counterpart thereof, inasmuch as the so-called record employed in reproduction may differ in character from that originally obtained) to travel past the point whereat the operation of the corresponding instrumentality, visual or auditory, is subjected to the control of such record. It will therefore be obvious that for the production of a perfect phono-kinematographic illusion it is essential that the picture and sound records respectively should maintain a constant predetermined relation to one another during their movement, throughout both the recording and reproducing operations.

To this end, according to the present invention, the original records, visual and auditory, are during the recording operation caused (by positively-acting mechanical devices) to travel concurrently and at velocities respectively bearing any desired ratio to one another past what may be termed the respective recording points, and whereby on the other hand the corresponding records, visual and auditory, employed in reproduction may be caused during the reproducing operation to travel past what may be termed the respective reproducing points in the same registration with one another and at velocities bearing the same ratio as that maintained between the original records.

The original records, visual and auditory, may be obtained concurrently and by whatever means upon a single travelling medium, and similarly the respective records, visual and auditory, employed in reproduction may be carried by a single travelling medium, absolute synchronism being thus ensured. Or the respective original records may be obtained concurrently and by whatever means upon separate media which during the recording operation are respectively caused to travel at speeds bearing any suitable ratio to one another; and similarly the corresponding records employed in reproduction may be carried by separate media whose movements, past the respective reproducing points, are performed at velocities bearing the same ratio to one another as that maintained between the original records. In each case accurate registration during reproduction may be effected by adjustment of the position of either reproducing point, when necessary, relatively to that of the other in the direction of the movement of the corresponding medium.

In cases where separate media are employed for the picture and sound records, the medium which is to receive, or which bears, the sound record (when the length of character of the latter precludes the employment of a cylinder or a disc of the well known photographic or gramophonic types), may be in the form of a strip having marginal perforations or otherwise adapted to receive motion, like the picture-film or strip which (as in the ordinary kinematograph) would serve for the visual record, from a rotary sprocket-drum over which it is passed.

The sprocket-drums (or equivalent propelling devices) for imparting motion to the strips for the picture and sound records respectively may be fast upon the same shaft so as to receive rotary motion therefrom at equal angular velocities, in which case any required difference in linear speed between the respective strips may be obtained by the use of sprocket-drums of correspondingly differing diameters. Or the respective sprocket-drums may be rotated at angular velocities corresponding to the linear speed required in the respective strips, in which case the propelling devices (whether forming parts of a single machine or of separate machines) may be geared together or to a common source of power in such manner that the desired velocity-ratio will be maintained. In either case the mechanism for imparting movement to both strips may be housed in a single casing, whilst the same propelling devices may be employed for both the recording and reproducing operations in turn.

In ordinary kinematographic apparatus, provision requires to be made for enabling the position of the "gate" (or other portion of the reproducing instrumentality) lengthwise of the picture-film to be adjusted relatively to the exposure-position of the pictures, in order that, during reproduction, the pictures may on exposure be presented in accurate alignment with the lens. Such adjustment, if effected independently of the reproductive instrumentality with which the auditory record coacts, may destroy registration between the visual and auditory reproductions. To obviate this, the apparatus employed to carry out the present invention may be provided with means whereby any adjustment of the kinematographic reproducing instrumentality lengthwise of the picture-film will produce a corresponding displacement of the sound-reproducing instrumentality (or of such part or element thereof as may be necessary) lengthwise of the sound-reproducing record. For this purpose, in cases where the respective records travel at different velocities, the sound and picture reproducing

instrumentalities would be connected by means of gearing such that any adjustment of the one would cause displacement of the other instrumentality in the proper direction and to an extent bearing the same ratio to the extent of movement imparted to the first instrumentality as that which exists between the velocities of the respective records.

The successive sections of the sound-record should be numbered or otherwise distinguished by marks in accordance with the corresponding pictures of the kinematographic record, so that (any part of the one record being readily identifiable with reference to the corresponding part of the other) both records may be started in correct registration with one another at any point in the length of each. Hence also (assuming the sound-record to be in the form of a strip like but separate from the picture-record), if any defective part should require to be excised from the one record, the corresponding portion of the other record may also be readily cut out, and, the cut ends of the respective records being joined up, no disturbance of the registration of the two records with one another will be caused. Furthermore, when a sound record is carried by a strip separate from the picture-film, the marking of the successive sections of the sound-record, as described above, ensures this record being passed through the reproducing apparatus in proper order instead of, as might otherwise happen, backwards.

I will next deal more particularly with the communication to the spectator of an impression of constant coincidence between the actual and the visually-apparent sources of the sounds as reproduced. The necessity for maintaining such an impression of coincidence is due to the fact that if (for example) an actor be kinematographically represented as speaking, and at the same time moving towards or from the spectator or from one side of the picture to the other, the perfection of the illusion will be impaired unless those sounds which represent the voice of the performer are at each instant made to appear as if they actually proceeded from whatever spot the speaker is himself visually represented as momentarily occupying.

According to my invention this illusory effect is obtained by means of two (or it might be more) separate sound-records both of which travel in synchronism and registration with the picture-film but each of which performs its functions in connection with only one side (right-hand or left-hand) of the scene of action or of the picture as the case may be. That is to say, for the purpose of obtaining the sound-records, there is placed towards each end of the proscenium (or at a corresponding point of the stage or scene of action) a separate instrumentality adapted to pick-up sound and in accordance therewith to control a corresponding sound-recording device past which one of the two recording media is made to travel; whilst for the purpose of reproduction there is placed towards each end of the kinematograph screen a separate sound-reproducing or so-called "speaking" instrumentality which is controlled by a separate record-translating device operated by that record which was originally obtained from the same end of the proscenium, or by a counterpart of said record. Although, however, the sound-reproduction will thus be due to the action of two (or more) records and two (or more) "speaking" instrumentalities, the auditory effect will be that of a single train of sounds which will appear to proceed from the vicinity of that end of the picture whereat the louder sound is actually for the moment being emitted.

The sound-recording and sound-reproducing devices referred to above are preferably both controlled electrically, each instrumentality employed to pick up the original sounds being in such case a sound-controlled electric current-regulator (which for convenience may be called a "stage-microphone") in circuit with the electrically operated or controlled device employed to produce the original record upon the corresponding travelling medium, whilst each record-translating device is also in such case an electric current-regulator in circuit with the electrically operated or controlled sound-reproducing or speaking instrumentality.

Thus, for example, for the purpose of obtaining the original sound-records, a separate stage-microphone may be placed towards each end of the front portion of the stage or other scene of action, the stage-microphone at each end being in circuit with a separate electrically operated or controlled recording instrumentality adapted to produce, on a continuously-travelling medium moving concurrently with the picture-record, a separate sound-record (of whatever kind) in accordance with the fluctuations set up, through the action of the stage-microphone, in the current flowing in the circuit of said recording instrumentality. Conversely, for the purpose of the sound-reproduction, a separate sound-reproducing device may be placed towards each end of the kinematograph screen, the device at each end being in circuit with a separate translating instrumentality governed by the sound-record (of whatever kind) borne by a continuously-travelling medium which is caused to move synchronously and in register with the kinematographic picture-film.

By this means, on the one hand two synchronous sound-records will be obtained, one from each end of the front of the stage (or scene of the incidents to be recorded), the intensity of the sound denoted by the two records varying reciprocally, as regards the respective records, in accordance with changes in the position of the source of sound relatively to the respective microphones, and also directly, in the case of both records, in accordance with variations in the distance of said source from the front of the stage or scene; whilst on the other hand, two synchronous sound-reproductions will be given forth, one from each end of the kinematograph screen, the loudness of the sound emitted by the reproducing devices varying reciprocally, as regards the respective devices, in accordance with the variations of sound-intensity denoted by the respective records (*i.e.* in accordance with the movements of the apparent source of sound from side to side of the picture), and also directly, as regards both reproducing devices, in accordance with variations in the apparent distance separating the pictorially-represented source of sound from the spectator, and the impression produced upon the auditor being that of a single train of sounds whose apparent source corresponds in position with whichever instrument happens, for the time being, to be emitting the loudest sound.

The number of records employed is not limited to two. Moreover more than a single stage-microphone may be employed in the circuit of each of the separate sound-recording instrumentalities, any number of stage-microphones, suitably disposed towards the corresponding side of the stage or scene and preferably connected in parallel, being permissible in each such circuit. Similarly, more than a single sound-reproducing device (and if desired, more than a single record-translating device) may be employed in conjunction with each of the two sound-reproducing records, any number of such devices being permissible if suitably disposed towards the corresponding end of the kinematograph screen.

In case where the action to be recorded takes place within a narrow space, the stage-microphones (if a plurality of these be employed) may all be placed near to or around the point of origin of the sound. Moreover, in similar cases, as the source of sound does not appreciably move relatively to the spectator, it is not essential that more than a single sound-record should be employed, a plurality of stage-microphones or a plurality of sound-reproducing devices (whether used in connection with one or a plurality of sound-records) merely serving in such case to enable a louder and clearer sound-reproduction to be obtained.

Each stage-microphone should be isolated so as to be prevented from receiving and transmitting other than aerially-conveyed sound-vibrations, in order that the sound-record shall not be marred in consequence of the stage-microphone being agitated by mechanical vibrations set up, for example, in the structure of the stage itself as a result of the movements of the actors, dancers, or other performers. Each stage-microphone should also be shielded as far as practicable from aerially-conveyed sound-vibrations which either originate apart from the

scene or incident of which it is desired to obtain a record, or which, although directly connected with the original scene or incident, have a character such that their partial suppression becomes desirable when the sounds are reproduced. Thus, for example, in obtaining the record of a performance comprising a song sung to orchestral accompaniment, the stage-microphones should be exposed in the direction of the singer but shielded in that of the orchestra, so as to permit the production of a record such that, on reproduction, the sound of the accompaniment would not drown the voice of the singer.

It will, moreover, be obvious that both the stage-microphones and the record-translating device should be secluded as far as possible from the influence of any vibrations (sound or mechanical) which are incidental to the mechanical or other operations involved in the process of obtaining, or reproducing from, the picture and sound records.

Dated this 25th day of October, 1911.

A. M. & WM. CLARK.
Chartered Patent Agents.
53, Chancery Lane, London, W.C.

COMPLETE SPECIFICATION.

Improved Means of Simultaneously Recording or Reproducing Sounds and Visible Movements Accompanying such Sounds.

I, AUGUSTUS ROSENBERG, of 259, High Holborn London, W.C. Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

My invention relates to systems of phono-kinematography, that is to say systems designed on the one hand to obtain, along with a kinematographic record of a continuous train of actions, a record of the sounds accompanying the actions, and on the other hand, to present, along with a kinematographic reproduction of the actions recorded, an auditory reproduction of the sounds which accompanied those actions.

The object of my invention is to provide a system embodying various improvements whereby, in the phono-kinematographic reproduction, the illusion of reality may be secured more fully and with greater certainty than heretofore. In this connection it is to be observed that perfection in the result attained is mainly dependent upon the fulfilment of certain conditions.

Of these conditions, the first and most essential is that, both in obtaining and in reproducing from the records, absolute synchronism and correct registration must be maintained between the kinematographic and auditory impressions.

Two systems have already been proposed, according to which this first condition is fulfilled by carrying the sound-record upon the picture-film, thus obviating the use of the expensive and often unsatisfactory method of electrical synchronization between electric motors serving respectively for propelling the picture and sound records. In the first of the systems referred to, the sound-record is in the form of a continuous series of alternating impressions of light and shade side-by-side with the kinematographic views themselves, whilst in the second system the sound-record is in the form of serrations or undulations on one or both edges of the picture-film.

A second condition is that, whether in obtaining or in reproducing from the records, the sound-receiver or sound-reproducer (*i.e.* the instrumentality for receiving or reproducing the aerial sound-pulsations) must be capable of being

placed in such proximity to the actual or to the visually-apparent source of sound, as the case may be, as may be necessary on the one hand to ensure the obtaining of a clear sound-record, and on the other hand to give to the spectator the impression that the sound, as reproduced, proceeds from the picture. Hence, where the sound-record is originally produced, or in reproduction operates, at or near the kinematographic apparatus (as would, for example, be the case where the sound-record is carried upon the picture-film as stated above), the sound-receiver or sound-reproducer must be capable of being placed at any distance from the kinematographic apparatus.

In the case of only the first of the proposed systems above referred to is this second condition fulfilled, electrical connections being for this purpose employed between the sound-receiver or sound-reproducer and the sound-recording or record-translating device, as the case may be. In the second of the proposed systems, the sound-receiver, being linked mechanically to the sound-recording device, is necessarily situated in close proximity thereto, and therefore also in proximity to the kinematographic apparatus.

A third condition is that, in obtaining the records, so long as a source of sound remains at substantially the same distance from the camera whereby the picture-record is obtained, the movements of said source of sound must not, for the purpose of obtaining a clear sound-record, be restricted to the immediate vicinity of any single sound-receiver, since otherwise the reproduced sound will appreciably vary in volume not only when its visually-apparent source is represented as approaching or receding from the spectator, but also when the visually-apparent source is represented as moving in or parallel to the plane of the picture at a substantially uniform distance from the spectator.

By neither of the systems already referred to is provision made for fulfilling this third condition. That is to say, in the first of the proposed systems, provision for only a single sound-receiver is made, and it will be evident that, with such an arrangement, a comparatively small movement on the part of the source of sound, in any direction, will alter the distance separating said source from the sound-receiver, and hence will result in a corresponding variation in the total volume of sound recorded, and therefore also in the strength of the sound as reproduced. In the second of the proposed systems, although sound-receivers may be used, both of these, being mechanically coupled to their respective sound-recording devices, are (as already pointed out) necessarily situated close to the camera, so that, as in the first system, movement of the source of sound in a direction perpendicular to the optical axis of the camera must be restricted within comparatively narrow limits in order to avoid such alteration in the conjoint distances separating the source of sound from the respective sound-receivers as would prevent variation in the total volume of sound recorded, since otherwise a corresponding fluctuation in the strength of the sound as reproduced will occur notwithstanding that the visually apparent source of the sound may be represented in the picture as remaining at a substantially uniform distance from the spectator.

A fourth condition is that, in reproduction, there must be communicated to the spectator an impression of constant coincidence between the actual and the visually-apparent sources of sound respectively, notwithstanding any movement of such visually-apparent source as exhibited by the kinematographic picture.

In neither of the systems already proposed is any provision made for fulfilling this fourth condition

According to the present invention, which (like the two proposed systems referred to) avoids the necessity of electrically synchronizing the movements of the picture and sound records, the first of the conditions mentioned above may be fulfilled without the restriction of employing the same film for both records. By my invention, the respective records may if desired be carried upon independent media, the sound-record being in any convenient form and carried either

by a strip or otherwise. The movements of the separate media (if used) are synchronized mechanically by gearing together positively the respective propelling devices, whilst provision is made for maintaining correct registration between the respective records.

Thus, for example, where the sound-record is in the form of a strip (like the picture-film of the ordinary kinematograph), it may have marginal perforations or be otherwise adapted to receive motion from a rotary sprocket-drum or equivalent propelling-device over which it is passed: the sound-record being however propelled continuously at a uniform velocity as distinguished from the picture film when (as in certain well-known arrangements of apparatus) said film is caused to advance intermittently between the intervals of obscuration which are necessary when successive views are substituted one for another.

The sprocket-drums (or equivalent propelling devices) for imparting motion to the strips for the picture and sound records respectively may be fast upon the same shaft so as to receive rotary motion therefrom at equal angular velocities, in which case any required difference in linear speed between the respective strips may be obtained by the use of sprocket-drums of correspondingly differing diameters. Or the respective sprocket-drums may be rotated at angular velocities corresponding to the linear speed required in the respective strips, in which case the propelling devices (whether forming parts of a single machine or of separate machines) may be geared together or to a common source of power in such manner that the desired velocity-ratio will be maintained. In either case the mechanism for imparting movement to both strips may be housed in a single casing, whilst the same propelling devices may be employed for both the recording and reproducing operations in turn.

In ordinary kinematographic apparatus, provision requires to be made for enabling the position of the "gate" (or other portion of the reproducing instrumentality) lengthwise of the picture-film to be adjusted relatively to the exposure-position of the pictures, in order that, during reproduction, the pictures may on exposure be presented in accurate alignment with the lens. Such adjustment, if effected independently of the reproductive instrumentality with which the auditory record coacts, may destroy registration between the visual and auditory reproductions. To obviate this, the apparatus employed to carry out the present invention may be provided with means whereby any adjustment of the kinematographic reproducing-instrumentality lengthwise of the picture-film will produce a corresponding displacement of the sound-reproducing instrumentality (or of such part or element thereof as may be necessary) lengthwise of the sound-reproducing record. For this purpose, in cases where the respective records travel at different velocities, the sound and picture reproducing instrumentalities would be connected by means of gearing such that any adjustment of the one would cause displacement of the other instrumentality in the proper direction and to an extent bearing the same ratio to the extent of movement imparted to the first instrumentality as that which exists between the velocities of the respective records.

As regards the second condition, this is preferably fulfilled in the case of the present invention (as in the first of the proposed systems already referred to) by the employment of electrical connections between the sound-receiver or sound-reproducer and the sound-recording or record-translating device, as the case may be.

In order to fulfil the third condition I employ, in obtaining the records, a plurality of sound-receivers so placed relatively to the source of sound that the conjoint distances separating said source from the respective sound-receivers, and therefore the total volume of sound recorded, will not appreciably vary so long as said source remains at a substantially uniform distance from the camera. A plurality of sound-records may also be employed, but, for the purpose of fulfilling the single condition in question, this is not essential, since, according

to my invention, all the sound-receivers may coact in the production of a single sound-record, in which case this single record will represent a substantially uniform volume of sound, and hence the sound as reproduced will exhibit a corresponding uniformity of volume.

As regards the fourth condition, it is to be observed that the necessity for communicating to the spectator an impression of constant coincidence between the actual and the visually-apparent sources of a train of sounds as reproduced, is due to the fact that if (for example) an actor be kinematographically represented as speaking, and at the same time moving not only towards or from the spectator but also from one side of the picture to the other, the perfection of the illusion will be impaired unless those sounds which represent the voice of the performer are at each instant made to appear as if they actually proceeded from whatever spot the speaker is himself visually represented as momentarily occupying.

According to my invention this illusory effect is obtained by means of two (or it might be more) separate sound-records both of which travel in synchronism and registration with the picture-film but each of which performs its functions in connection with only one side (right-hand or left-hand) of the scene of action or of the picture as the case may be. That is to say, for the purpose of obtaining the sound-records, there is placed towards each end of the proscenium (or at a corresponding point of the stage or scene of action) a separate sound-receiver or instrumentality adapted to pick up sound and in accordance therewith to control a corresponding sound-recording device past which one of the two recording media is made to travel; whilst for the purpose of reproduction there is placed towards each end of the kinematograph screen a separate sound-reproducer (or so-called "speaking" instrumentality) which is controlled by a separate record-translating device operated by that record which was originally obtained from the same end of the proscenium, or by a counterpart of said record. Although, however, the sound-reproduction will thus be due to the action of two (or more) records and two (or more) "speaking" instrumentalities, the auditory effect will be that of a single train of sounds which will appear to proceed from the vicinity of that end of the picture whereat the louder sound is actually for the moment being emitted.

The sound-recording and sound-reproducing devices referred to above are preferably both controlled electrically, each sound-receiver being in such case a sound-controlled electric current-regulator (which for convenience may be called a "stage-microphone") in circuit with the electrically operated or controlled device employed to produce the original record upon the corresponding travelling medium, whilst each record-translating device is also in such case an electric current-regulator in circuit with the electrically operated or controlled sound reproducing or speaking instrumentality.

By such means, on the one hand two synchronous sound-records will be obtained, one from each end of the front of the stage (or scene of the incidents to be recorded), the intensity of the sound denoted by the two records varying reciprocally, as regard the respective records, in accordance with changes in the position of the source of sound relatively to the respective microphones, and also directly, in the case of both records, in accordance with variations in the distance of said source from the front of the stage or scene: whilst on the other hand, two synchronous sound-reproductions will be given forth, one from each end of the kinematograph screen, the loudness of the sound emitted by the reproducing devices varying reciprocally, as regards the respective devices, in accordance with the variations of sound-intensity denoted by the respective records (*i.e.* in accordance with the movements of the apparent source of sound from side to side of the picture), and also directly, as regards both reproducing devices, in accordance with variations in the apparent distance separating the pictorially-represented source of sound from the

spectator, and the impression produced upon the auditor being that of a single train of sounds whose apparent source corresponds in position with whichever instrument happens, for the time being, to be emitting the loudest sound.

In the accompanying drawing, which illustrates diagrammatically one form of apparatus for carrying out my invention, A represents a theatrical stage the actions performed upon which, together with the accompanying sounds, it is desired first to record and afterwards to reproduce, whilst B represents the casing of the recording and reproducing mechanism.

The kinematographic portion of the mechanism may be of any convenient type, the only portions indicated in the diagram being the lens C with its carrier *c*, the sprocket-drum D for propelling the picture-record E, and the paying-out and taking-up rollers F and G (assuming such to be employed) between which the record E is caused to travel past the lens by the sprocket-holes *e* at the margins of the strip which bears the picture-record engaging over sprocket-teeth on the drum D as usual.

H^1 and H^2 are two so-called stage-microphones placed one at each side and towards the front of the stage A for the purpose of picking-up the sounds which accompany the theatrical action, each stage-microphone serving to control the production of a separate sound-record. The sound-records are (in the example illustrated) to be understood as produced photographically side by side upon a single strip J, the one record K^1 being produced under the control of the stage-microphone H^1 whilst the other record K^2 is produced under the control of the stage-microhpone H^2 as hereafter more particularly explained.

The strip J which bears the sound-records extends parallel with the strip E which bears the picture-record, and like the latter is caused to travel between paying-out and taking-up rollers L and M by the sprocket-holes *j* at the margins of the strip engaging over sprocket-teeth on a sprocket-drum N. The drums N and D are positively driven (through the medium of any convenient mechanism) at suitable peripheral velocities corresponding to the linear speeds required in the respective record-strips J and E, so as to ensure these strips moving in perfect synchronism with one another. For this purpose, in the example illustrated, both sprocket-drums are fast upon the same shaft O, which is rotated at a uniform angular velocity; the difference (if any) required between the linear speeds of the respective strips J and E being obtained by employing drums N and D of correspondingly differing diameters, as indicated. Thus, in the example illustrated, the linear speed required in the strip J which bears the sound-records is assumed to be three times as great as that of the strip E which bears the picture-record, the diameter of the drum N being likewise three times as great as that of the drum D. In the event of the picture-record being moved intermittantly past the lens C, usual means (not indicated) may be provided for producing a slack loop upon the strip E and for taking up the slack in time with the movement of the obscuring shutter, as will be readily understood.

The sound-recording devices P^1, P^2 through the medium of which the records K^1 and K^2 are produced, are (in the example illustrated) understood to be light-projecting instrumentalities whose illuminating power is controlled electrically by means of the respective stage-microhpones H^1, H^2; each stage-microphone H^1 or H^2 serving to control a separate electric circuit fed with current from a battery (or other source) h^1 or h^2 and passing through suitable electric apparatus in connection with the recording device P^1 or P^2, so that variations in electric resistance produced, in the corresponding circuit, by the action of each stage-microphone will produce similar variations in the light-intensity of the device P^1 or P^2, which variations are utilized in producing the record itself.

The apparatus employed in reproduction may equally well be represented by the same diagram, it being however understood that in this case A represents the

kinematographic screen, H^1, H^2, sound-reproducing devices placed at or near each end of the screen, and P^1, P^2 sound-record translating devices adapted to control, electrically, the respective devices H^1, H^2, the translating devices P^1, P^2 being themselves actuated or controlled by the sound-reproducing records K^1, K^2 respectively, and all these operations being effected in any convenient manner.

Correct registration between the picture and sound reproductions is ensured by causing any adjustment of the lens-carrier *c* lengthwise of the picture-record strip E to bring about automatically a corresponding adjustment of the carrier *p* (with the sound-producing devices P^1, P^2) lengthwise of the strip J. For this purpose, in the example illustrated, the lens-carrier *c* has attached to it a longitudinally extending rack q^1 with which gears a toothed pinion Q^1 fast on a shaft Q journalled in stationary bearings, whilst the carrier *p* has attached to it a similar and parallel rack q^2 with which gears another toothed pinion Q^2 fast on the same shaft Q: the ratio between the diameters of the pinions Q^1 and Q^2 being the same as that between the diameters of the sprocket-drums D and N. Hence when the lens-carrier *c* is adjusted (as for example by means of a finger-wheel R actuating a pinion *r* in mesh with the rack q^1) lengthwise of the strip E, the carrier *p* will be caused to move as much farther lengthwise of the strip J as the latter strip travels faster than the strip E, with the result that correct registration between the records, if once established, will be automatically maintained.

Successive pictures of the kinematographic record, as indicated at e^1 . . . . . e^6, would be numbered consecutively, and the corresponding sections j^1, j^2 *etc.* of the sound-records would be similarly numbered, as indicated, so as to ensure that in the operation of reproduction the respective records shall always be started in correct mutual registration.

The number of sound-records employed is not limited to two. Moreover, more than a single stage-microphone may be employed in the circuit of each of the separate sound-recording instrumentalities, any number of stage-microphones, suitably disposed towards the corresponding side of the stage or scene and preferably connected in parallel, being permissible in each such circuit. Similarly, more than a single sound-reproducing device (and if desired, more than a single record-translating device) may be employed in conjunction with each of the two sound-reproducing records, any number of such devices being permissible if suitably disposed towards the corresponding end of the kinematograph screen.

Each stage-microphone should be isolated so as to be prevented from receiving and transmitting other than aerially-conveyed sound-vibrations, in order that the sound-record shall not be marred in consequence of the stage-microphone being agitated by mechanical vibrations set up, for example, in the structure of the stage itself as a result of the movements of the actors, dancers, or other performers. Each stage-microphone should also be shielded as far as practicable from aerially-conveyed sound-vibrations which either originate apart from the scene or incident of which it is desired to obtain a record, or which, although directly connected with the original scene or incident, have a character such that their partial suppression becomes desirable when the sounds are reproduced. Thus, for example, in obtaining the record of a performance comprising a song sung to orchestral accompaniment, the stage-microphones should be exposed in the direction of the singer but shielded in that of the orchestra, so as to permit the production of a record such that, on reproduction, the sound of the accompaniment would not drown the voice of the singer.

It will, moreover, be obvious that both the stage-microphones and the record-translating device should be secluded as far as possible from the influence of any vibrations (sound or mechanical) which are incidental to the mechanical or other operations involved in the process of obtaining, or reproducing from, the picture and sound records.

Having now particularly described and ascertained the nature of the said

invention and in what manner the same is to be performed, I declare that what I claim is :—

1. A system of phono-kinematography wherein, in the recording operation there are employed, concurrently with the kinematographic-recording device, a plurality of sound-transmitting instrumentalities so placed relatively to the point of origin of a train of sounds to be recorded that the total volume of the sounds of said train, as recorded, will remain unaffected by movement of the source of the sounds relatively to the respective transmitting instrumentalities, so long as said source remains at a substantially uniform distance from the camera, substantially as set forth.

2. A system of phono-kinematography according to Claim 1, wherein, in the reproducing operation there is employed, concurrently with the kinematographic reproducing device, a sound-reproducing device or devices whose operation is controlled by a sound-record produced under the control of the plurality of transmitting instrumentalities specified in said claim, substantially as set forth.

3. A system of phono-kinematography according to Claim 1 wherein, in the reproducing operation, there are employed, concurrently with the kinematographic reproducing device, a plurality of sound-reproducing devices whose operation is controlled, severally, by separate sound-records produced respectively under the control of the several sound-transmitting instrumentalities specified in said claim, substantially as set forth.

4. A system of phono-kinematography according to Claim 1, wherein the picture and sound records, in the operations both of obtaining and of reproducing from said records, are propelled by means of devices whose movements are mechanically synchronized with one another, substantially as set forth.

5. In a system of phono-kinematography according to Claim 4, the employment of independent picture and sound records each on a separate film or strip of material, substantially as set forth.

6. In a system of phono-kinematography according to Claim 5, the employment for the purpose of propelling the independent picture and sound records, of separate sprocket-drums or equivalent devices fast upon a single shaft, substantially as set forth.

7. In a system of phono-kinematography according to Claim 6, the employment of sprocket-drums whose diameters are proportioned to the linear velocities required in the respective records, substantially as described.

8. In a system of phono-kinematography according to Claim 5, the employment of sprocket-drums mechanically geared together or to a common source of power so as to be driven at peripheral speeds corresponding to the linear velocities required in the respective records, substantially as described.

9. In a system of phono-kinematography as specified, the employment for the purpose of ensuring correct registration between the visual and auditory reproductions, of means whereby adjustment of the "gate" lengthwise of the picture film is caused to effect an equivalent adjustment in the case of the sound-record translating-instrumentality, substantially as set forth.

10. In a system of phono-kinematography according to Claim 5, marking the corresponding sections of the picture and sound records respectively in accordance with one another, substantially as and for the purpose set forth.

11. In a system of phono-kinematography as specified, the employment in combination, in the operation of obtaining the record, of separate instrumentalities placed towards opposite ends of the front of the stage or scene of action and adapted to pick up sound and electrically control independent sound-recording devices operating on separate records, substantially as and for the purpose set forth.

12. In a system of phono-kinematography as specified, the employment in combination, in the reproducing operation, of separate sound-reproducing instrumentalities placed towards opposite ends of the kinematograph screen, separate

sound-records produced according to Claim 11, and separate record-translating devices adapted to be controlled by the respective sound-records and to electrically control the respective sound-reproducing instrumentalities, substantially as and for the purposes set forth.

13. In a system of phono-kinematography according to Claim 11, the employment for picking-up sound at each end of the front of the stage or scene of action, of a plurality of so-called stage-microphones in parallel electric connection with one another, substantially as set forth.

14. In a system of phono-kinematography according to Claim 12, the employment at each end of the kinematograph screen, of a plurality of sound-reproducing devices concurrently controlled electrically by the corresponding record-translating device, substantially as set forth.

15. In a system of phono-kinematography as specified, the combination with a single sound-record and a single electrically-controlled sound-recording device adapted to operate thereon, of a plurality of devices for picking-up sound placed near to or around the point of origin of the sound and electrically connected in parallel with one another, substantially as set forth.

16. In a system of phono-kinematography according to Claim 11, the employment in the operation of obtaining the record, of a single strip bearing side-by-side the picture-record and the two independent sound-records, substantially as set forth.

17. In a system of phono-kinematography according to Claim 12, the employment in the reproducing operation, of a single strip bearing side-by-side the picture record and the two independent sound-records, substantially as set forth.

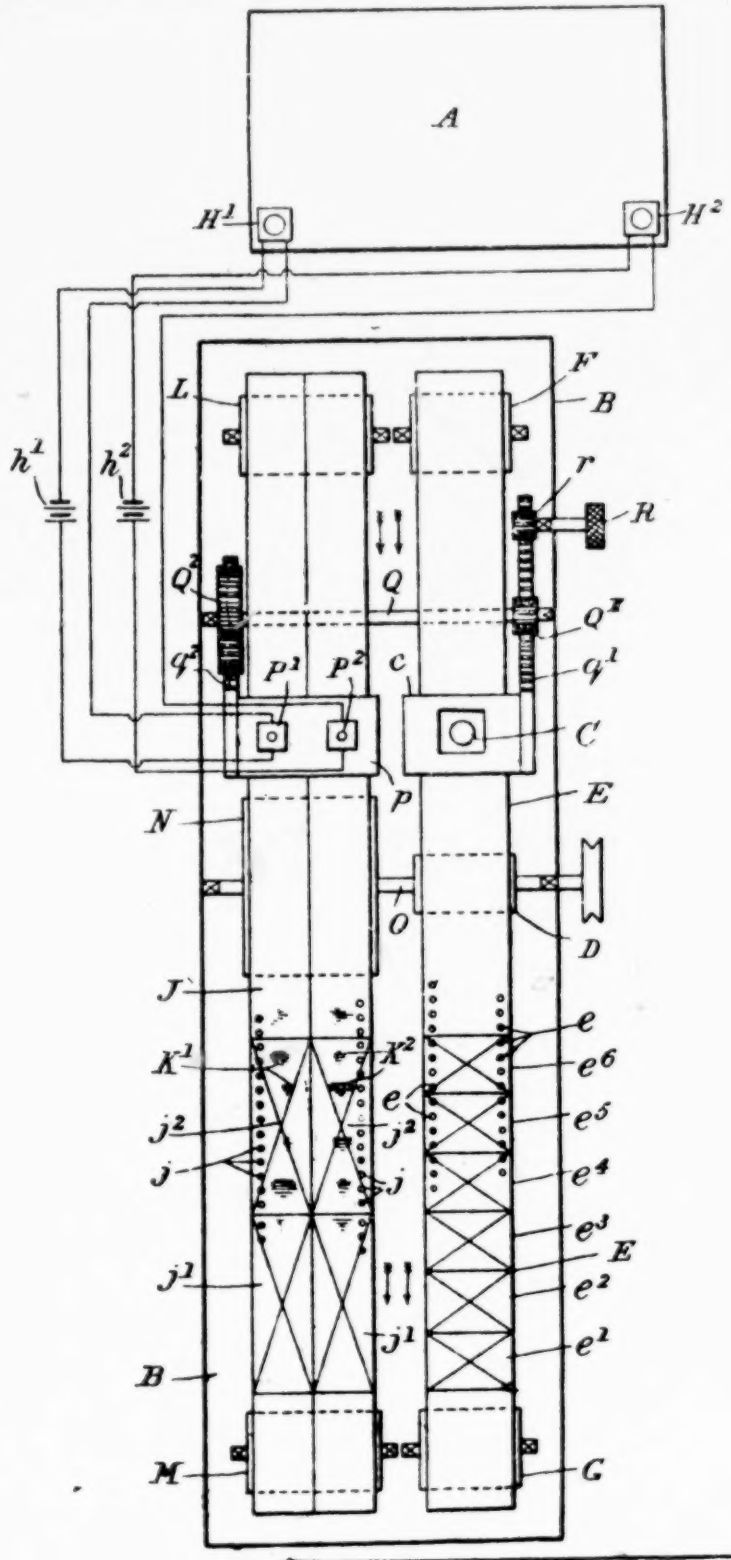
18. In a system of phono-kinematography as specified, the employment of stage-microphones isolated so as to be prevented from receiving and transmitting other than aerially-conveyed sound-vibrations, substantially as and for the purpose set forth.

19. The improved system of phono-kinematography, substantially as herein described with reference to the accompanying drawing, for the purposes set forth.

Dated this 25th day of April, 1912.

A. M & WM. CLARK,
Chartered Patent Agents,
53, Chancery Lane, London, W.C.

[This Drawing is a reproduction of the Original on a reduced scale]



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Complete Specification Left, 16th Sept., 1913—Accepted, 19th Mar., 1914

PROVISIONAL SPECIFICATION.

Improvements in Kinematograph Apparatus and Pictures.

I, ALBERT ERNEST DOWNING, 12, Nicholls Street, West Bromwich, Engineer, do hereby declare the nature of this invention to be as follows:

This invention relates to kinematograph pictures, & also to the apparatus to make possible the insertion into the moving picture, the words that are spoken by the actors, or words applicable to the scenes depicted, in such a way that the words & actions synchronize.

This invention is designed to greatly extend the usefulness & educational value of the kinematograph, & make possible the production of works which do not depend entirely on the dramatic effect of the scenes, & actions, but on the words uttered by the various characters, or noble thoughts & sentiments expressed by authors, which under existing modes of production are almost lost.

In the moving picture in accordance with this invention, the words uttered by the various characters, or words descriptive of events or scenes, are made to appear & move synchronously across the picture, preferably from right to left, either at the top or bottom.

The words can be made to appear black, or white, or in colour, according to the method used to print them upon the films.

To make a kinematograph picture according to this invention, it is necessary to have a ribbon of suitable length, made of paper or linen, or other suitable material, with all the moving words that should appear on the complete compound picture printed thereon, & so spaced that each word & space has the position it should occupy in relation to the picture it is to be inserted into.

There are several ways I can make these ribbons of correctly spaced words, one way I provide a phonograph which runs at an unvarying speed. In conjunction with this phonograph, I have a clockwork or other suitable means to make a distinct sound, at every second or certain fraction of a second, which is recorded by the phonograph. These sounds form period indicators when making the ribbon from the dictation of the phonograph.

When the play is being acted, the camera is used as usual to make a film, but in addition to the camera, the phonograph is started & under most favourable circumstances makes a record of what is being said.

When it is impossible to actually record the speeches of the actors I provide an operater for the phonograph, who repeats all the actors say & in suitable periods of the play he or she can explain & amplify the story that is being portrayed.

When a record is made, it is necessary to print all the words recorded onto a ribbon, each word being correctly spaced in relation to the others & the pauses & intervals of rest between the spoken words. To accomplish this I provide a typewriter or the like of special construction, that prints upon a ribbon passing continuously into position, one equal space at a time at every depression of the keyboard. Assuming, that on an average there are fourteen letters in the words spoken in a second, then for every fourteenth part of a second recorded

on the phonograph record, one space of the ribbon equal to one printed letter is moved forward. The time indicator on the record shows exactly what words & spaces should appear on the strip of ribbon representing each respective second, so that when finished, each word has its correct space in proportion to the whole length of ribbon. I provide on the typewriter a simple mechanism, which gives the exact length of the completed ribbon. There is also a mechanism on the camera which gives the exact length of the film. To make this compound film, the exact length of the printed ribbon & the film, as recorded by their respective mechanisms, is carefully taken, & by a simple calculation the exact speeds necessary to run the camera & the ribbon, can be ascertained, that is needed to obtain a kinematograph film of the ribbon, the exact length of the first film.

The ribbon is made to pass before a kinematograph camera preferably from right to left & the spools or drums or the like which hold the ribbon are driven by mechanism from the camera, that can be accurately adjusted by means of expanding pullies or compound gearing to impart to the ribbon the speed necessary to run it past the camera, to produce a film with the words of the ribbon thereon exactly the length required. The improved films with the words & subject combined can now be photographically printed from the two films suitably held together, or the two films can be run through the kinematograph together, & so thrown onto the screen.

To make a clearer print of a compound film, I can cut away or perforate much of the blank part of the ribbon film, leaving only sufficient material for strength, to carry it through the machine. In a modification of this invention, a recording ribbon can be produced without a phonograph, in which case a ribbon is given a certain forward movement, & a time recorder regularly marks the seconds or fractions of a second onto it & a stenographer writes in shorthand or other applicable method, all that is taking place, or being said onto this moving ribbon. Another ribbon suitable for reproduction is made from this, as here-in-before described.

Dated the 18th day of March, 1913.

ALBERT ERNEST DOWNING.

COMPLETE SPECIFICATION.

Improvements in Kinematograph Apparatus and Pictures.

I, ALBERT ERNEST DOWNING, 12, Nicholls Street, West Bromwich, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in kinematograph pictures and has for its object the making of films for kinematograph pictures which will show when thrown upon the screen, by the usual projector, words moving across the living picture readable to the audience, and may be single ejaculations, short isolated sentences or long passages, appertaining to the pictures they accompany.

These words may be descriptive of scenes or events or the reproduction of the actual words spoken by the various characters. They appear and move at the same time and speed as the characters in the pictures seem to speak them.

Various ways have been tried to give realism to kinematography.

In some cases the phonograph has been adopted, but beside the difficulties in making the reproduced words sound natural and synchronous with the picture, it is costly, and also necessary to have special apparatus needing expert attention every time the picture is shown. Another way of giving realism is to have

a moving band with the words printed thereon moving at the same time as the picture view, but quite separate therefrom.

This invention comprises a special way of taking a kinematograph picture in combination with a time recorder and indicator both audible and visible and also a typewriter to print words correctly spaced on a continuous ribbon or the like. Also the means to make a film with words on, of a certain definite length also a special way of recording all words that are required to appear on the film giving indications of time, and also the process of printing the words from one film onto another (the picture film) in such a manner that they describe and appertain to the picture or series of pictures.

In the moving picture, in accordance with this invention the words uttered by the various characters, or words descriptive of events or scenes, are made to appear and move synchronously across the picture, preferably from right to left either at the top or bottom.

The words can be made to appear black or white; or in colour, according to the method used to print them upon the films

To make a kinematograph picture according to this invention, it is necessary to have a ribbon of suitable length with perforations along the edges, or plain, made of paper or other suitable material, with all the moving words that should appear on the complete compound picture printed thereon, and so spaced, that each word and space has the position it should occupy in relation and proportionate to the picture it is to be inserted into.

To make these ribbons of correctly spaced words a phonograph or a stenographer or other suitable means can record all that is being said or done by the various characters whilst the photographs are being taken. In conjunction with this phonograph I have a clockwork or other suitable means to make a distinct sound at every second or certain fraction of a second, which is also recorded on the phonograph record. These distinct and regular sounds form period indications when making the ribbons from the dictation of the phonograph.

I have assumed 14 to be the maximum number of letters in the words spoken in a second, in this case for every second indicated on the phonograph (or in the modification by the stenographer) 14 spaces of the ribbon that is being printed upon by the typewriter are moved forward, no matter if much fewer letters are contained in the words used or if no words are spoken, each second elapsing when taking the photographs is represented by the same length of ribbon. Of course the maximum number of letters may be more or less than 14, but whatever the maximum number of letters or letter spaces in any second, each second of that series must be represented by the same length of ribbon. The time recorder shows on its face the seconds and minutes and is so arranged in position that the seconds and minutes, as the finger moves, are shown unobtrusively on all the photographs, and aided by these indications on the photographs, any section can be correctly defined, and words appertaining only to certain portions of the picture can be easily inserted. When it is undesirable to use a phonograph to record what is being said or happening, a stenographer can take a record in shorthand, or other suitable means. To do so, I provide a ruled paper showing numbered sections preferably representing seconds. The stenographer when writing, can so apportion what he is recording by means of the visible and audible time register that each respective second of the speech is written in the space corresponding with the number of the seconds. When the play or picture is to be taken, the camera is used as usual (but in conjunction with the time recorder) to make a film, and the phonograph or the stenographer proceeds to record what is being said or done. When all the words and actions are recorded, it is necessary to print the words onto a ribbon or the like, each word being correctly spaced in relation to the others, and the pauses and intervals of rest between each word.

To accomplish this, I provide a typewriter or the like having a mechanism that holds a roll or ribbon of paper or the like & allows the type to print upon

the ribbon passing continuously into position, one equal space at a time, at every depression of the key board. Instead of the usual typewriter carriage, I provide a drum or the like on one side of the typewriter to hold the blank ribbon and on the other a drum to hold the printed ribbon. The ribbon can be plain or can be perforated along its edges to engage in projecting teeth on a wheel or wheels which move one tooth at each depression of the keyboard so imparting the necessary movement to the ribbon in alignment and for any length. Assuming that on an average there are fourteen letters in the words spoken in a second, then for every fourteenth part of a second, recorded by the phonograph, or stenographer, one small piece of ribbon equal to one printed letter is moved forward. The time indicator on the record shows exactly what words and spaces should appear on the strip of ribbon representing each respective second, so that when finished, each word has its correct space in proportion to the whole length of ribbon. A simple mechanism on the typewriter gives the exact length of the completed ribbon, and also a mechanism on the camera gives the exact length of the film. To make this compound film, the exact length of the printed ribbon and the film, as recorded by their respective mechanisms, is carefully taken and by a simple calculation, the exact speeds necessary to run the camera and the ribbon, can be ascertained, that is needed to obtain a kinematograph film of the ribbon the exact length of the first film. By making the ribbon in sections by the aid of the recorded time, shown on the photographed indicator, any variation in the speed of the camera is reduced to a minimum. The printed ribbon is made to pass before a camera and the spools or drums which hold the ribbon, are driven by mechanism in conjunction with the camera. These drums or the like can be accurately adjusted by means of expanding pulleys, compound gearing, or making a pulley dead to size, and driving by a band, to impart to the ribbon the speed necessary to run it past the camera, to produce a film with the words of the ribbon thereon exactly the length required. The improved films with the words and subject combined can now be photographically printed from the two films suitably held together, or a stencil can be made of the ribbon film by perforating the printed words, and, by applying colour to these perforations, the words can be produced onto the picture film. To make a clearer print of a compound film much of the blank parts of the ribbon film can be perforated or cut away, leaving just sufficient strength for their proper manipulation.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

Improvements in kinematograph apparatus and pictures, consisting in this, that from two films or the like on which are respectively displayed, pictures and appropriate descriptive or other words, there is produced a single film containing the said pictures and words in proper order so that when the pictures are thrown or projected on to the screen by the usual lantern there are simultaneously projected on to the screen from the same film the words appropriate to the said pictures, substantially as described.

Dated the 15th day of September, 1913.

ALBERT ERNEST DOWNING.

N° 18,163 A.D. 1913

Date of Application, 9th Aug., 1913—Accepted, 10th Aug., 1914

COMPLETE SPECIFICATION.

Improvements in and relating to Combined Moving Picture and Talking Machine.

I, GUSTAV JULIUS KINDERMANN, a Confectioner, residing at Park Terrace, Wayville, in the State of South Australia, in the Commonwealth of Australia, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in connection with combined moving picture and talking apparatus of the kind in which a film is employed having in addition to the usual series of pictures, a phonographic track serving as a record for the talking machine part of the apparatus.

The invention consists mainly in the provision on a cinematographic film of a marginal strip having on its surface a phonographic grooved track or record.

According to the invention moreover, a photographic film for use in cinematographic apparatus, is provided with a marginal strip coated with wax to form a phonographic record surface.

The invention also comprises the apparatus hereinafter described for use with such combined films and strips.

In the accompanying drawings:

Figure 1 is a diagrammatic view partly in side elevation and partly longitudinal section of my combined moving picture camera and recording machine.

Figure 1ª is a diagrammatic detail view showing the relative positions of the phonographic sound box, and the photographic portion of the apparatus.

Figure 2 is a view in elevation and partly diagrammatic showing my apparatus for reproducing the pictures and sounds recorded by the machine illustrated in Figure 1.

Figure 3 is a detail view of part of the mechanism shown in Figure 2.

Figure 4 is a detail perspective view of a portion of my combined picture and sound film.

Figure 5 is a cross sectional view taken through the hub of one of the film reels and showing the manner of securing the end of the film at the hub.

In the production of what is known at the present time as "talking pictures" it is an exceedingly difficult matter to reproduce the pictures in synchronism with the sound so that the persons or figures of the picture will appear to be giving forth the proper sounds at the proper time, and the particular purpose of this invention is to remedy such objection.

Prior to entering upon a detailed description of my invention I might state briefly that in the practice of the latter in making the sound, and photographic records I first provide a film which is in the nature of a combined picture and sound recording film, the major portion of the film being of the usual character employed for taking moving pictures, this film having extending longitudinally of the edge thereof and on the surface thereof a marginal "sound" strip or film which may be termed the "sound film". This sound film is preferably in the nature of a relatively thin flexible zinc strip which is covered with wax for the purpose of having sound producing grooves formed thereon by the recording

apparatus. This sound recording machine is combined with a moving picture camera of the continuous feed type, so that if a musical performance is to be produced, the photograph of the actors will be taken by the camera at the same time the musical composition being sung is being recorded on the sound recording portion of the film. After the record of the performance has been made, the zinc sound section of the film is used to make a reproducing record, much in the manner that the ordinary gramophone record is made. For instance, the strip may be etched with an acid, and used as a mould in the production of the reproducing film. This latter film may be of any suitable material, such as celluloid, or if desired, may be in the nature of a flexible vulcanite film, such as is used in speaking clocks. After the reproducing film has been made, it is fastened to the reproducing picture film so that the picture film and the sound film will be unitary as they pass through the machine.

In giving a performance the reproducing film is run through a combined exhibiting and sound reproducing machine, having a continuous feed by which the scenes or pictures are projected upon the screen, and at the same time the needle or stylus running in the sound grooves of the sound film, causes a composition to be reproduced through the medium of a receiver, similar to a telephone receiver and connected in circuit with the transmitter. Thus the pictorial scenes and the composition will be simultaneously rendered.

I will first proceed to describe the apparatus for taking the pictures and recording the sounds.

Referring now, especially to Figure 1 of the drawings, wherein I have shown a record making machine, the numeral 1 indicates a casing which is mounted upon a suitable support 2, this casing containing the camera section C and the sound recording section S. The numeral 3 designates a partition having the upper slot 4 and the lower slot 5. Adjacent to the upper slot is mounted a film reel 6 from which the combination sound picture recording film F runs, this film passing through the slot 4, thence over the roller 7, through the slots C^1 of the camera section, thence over the roller 8 to the lower film reel 9. In order to drive the lower film reel 9 and consequently move the film, I employ a rotatable shaft 11, which is designed to have a handle (shown in dotted lines in Figure 1) attached thereto. The shaft 11 carrying the sprocket 12 meshes with the intermediate sprocket wheel 13, the latter in turn meshing with the gear 14 on the shaft 15 of the lower reel 9. As the latter rotates, it winds up the film, drawing the picture taking portion P thereof past the lens of the camera section C so that the picture or scene is recorded in the usual manner, while the sound recording section R of the film which as stated, is preferably made of a thin flexible strip of zinc covered with wax, is drawn past the recording stylus 16 on the sound box 17 of the sound recording portion S of the apparatus. The latter includes the horn 18, the bell mouth of which is shown at 19 and terminates at the opening 20 formed in the partition 21, the latter of which has a central opening 22 for the passage of the body portion of the camera section C. The front of the casing is formed of a mica ruby sound transmitting diaphragm 23 having a central collar or ring 24 through which the camera body may project. The diaphragm, while it excludes the light from the casing and therefore prevents the destruction of the film, allows the sound to be transmitted from the megaphone or horn H at the front of the casing through to the horn 18 and thence to the box 17, the sound being recorded on the film by the stylus 16, which may pass through a slot 16^1 to engage with the sound film the stylus being shown as not contacting with the "sound" film in Fig. 1. A spring 25 and adjacent screw 26 are employed for adjusting the tension or the pressure of the stylus 16 upon the sound portion R of the film.

After the original or zinc record film has been made, it is stripped or separated from the picture portion P of the film and etched with acid and used as a mould for producing a matrix as in the method of making gramaphone records. The sound reproducing film is formed by placing a celluloid or other composition film

or strip against the matrix and subjecting such composition film to sufficient pressure to make a positive film. The picture section P of the film is developed and printed in the usual manner, and by securing the sound and picture reproducing films so formed, one to the other, the combined reproducing sound and picture film is ready for reproduction.

Referring to Figure 4 it will be seen that as the sound section R and the picture section P of the record film form practically a unitary strip as they pass through the recording machine, the sounds would be recorded simultaneously and at proper intervals with the pictures, for instance, any unevenness of the feed of the film would not interfere with the recording of the sounds simultaneously with the taking of the pictures, that is to say, should the picture film section jump or trip going through the lens for an instant, the sound recording part of the film would do likewise.

Should it now be desired to run the combined picture film and sound film through a machine for reproduction, this may be done with the apparatus shown in Figure 2.

Referring to said Figure 2, the numeral 27 designates a base upon which is mounted the frame 28 of the exhibiting machine. The film travels over the spools 29 and the sprocket spools 30 and 31, which are of the usual construction, the film passing in front of the projecting portion of the machine at 32, so that it is thrown or exhibited upon the screen. The numeral 33 indicates a sound box having a stylus or sapphire point 34 which is designed to work in the sound grooves of the sound film section R^1. This sound box is constructed on the principles of a telephone transmitter and is resiliently mounted by means of a spring 35 on the arm 36 carried by the bracket 37. As the film passes in front of the projecting apparatus, the stylus working in the groov reproduces the sounds which are transmitted through an electric circuit to the horn or megaphone M, by which they are conveyed to the audience. This electric circuit includes the wires 38 and 39 connected to the binding posts 40 and 41 respectively at the "transmitter" and to the binding posts 42 and 43 at the "receiver" or horn from which the sound is transmitted to the audience, a battery 44 being interposed in the circuit. The letter M^1 designates a mo or, the shaft 45 of which carries a drive pulley 46 connected through the belt 47 to the drive pulley 48 on the shaft 49, which shaft also carries a drive pulley 50 for driving the belt 51 which runs over the pulley 52 on the shaft 53, this shaft being journalled in standards 54 and carries the spool 29, over which the film runs and by which it is driven.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. The provision on a cinematographic film, of a marginal strip having on its surface a phonographic grooved track or record, substantially as and for the purpose hereinbefore set forth.

2. For use in connection with cinematographic apparatus, a photographic film having a marginal strip coated with wax to form a phonographic record surface substantially as and for the purpose hereinbefore set forth.

3. Cinematographic apparatus for use with films and strips as claimed in Claims 1 or 2, substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 9th day of August, 1913.

MATHYS & Co.,
Chartered Patent Agents,
43, Chancery Lane, London, W.C.

[This Drawing is a reproduction of the Original on a reduced scale.]

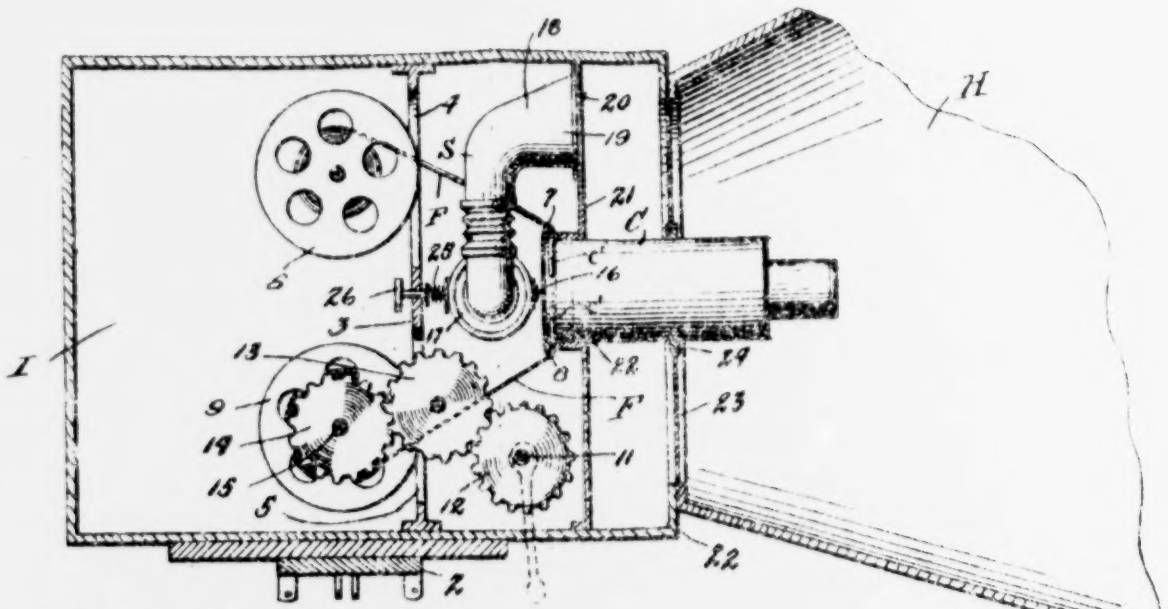

Fig. 1.

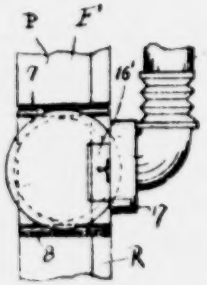

Fig 1a

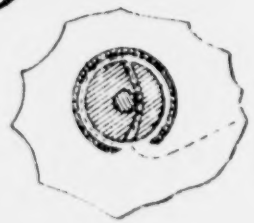

Fig. 5.

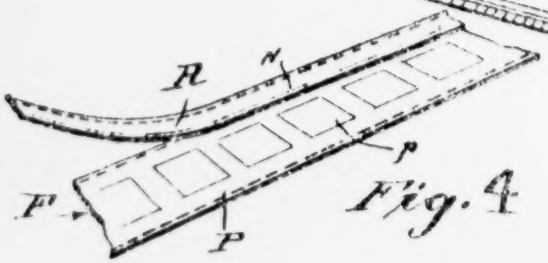

Fig. 4

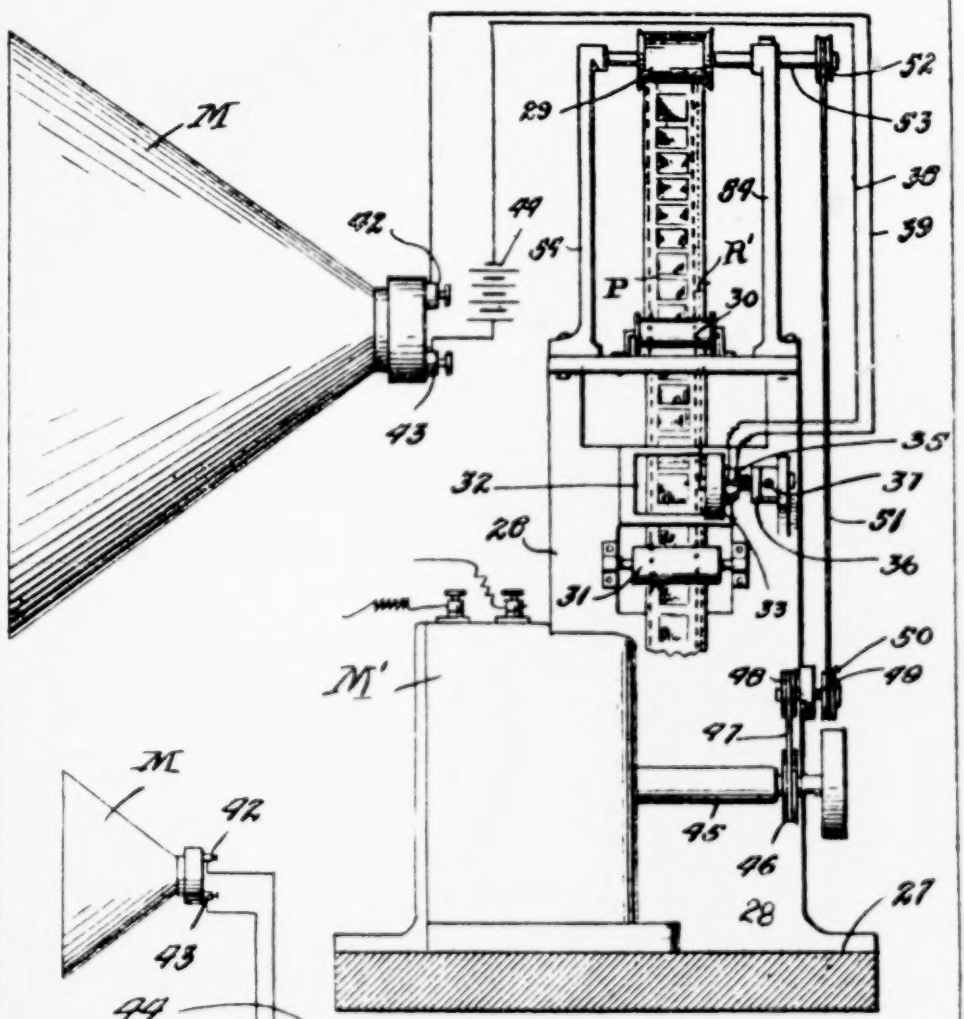

Fig. 2.

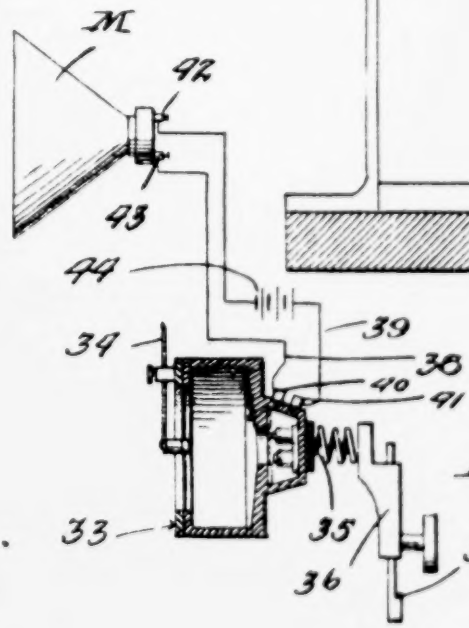

Fig. 3.

[This Drawing is a reproduction of the Original on a reduced scale.]

115,942

PATENT SPECIFICATION

Application Date, June 25, 1917. No. 9080/17.

Complete Accepted, May 30, 1918.

COMPLETE SPECIFICATION.

Method of Recording and Reproducing Simultaneously Movements and Sounds.

I, HANS PEDERSEN, of 3, Istedgate, Copenhagen, Denmark, Patent Agent, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a process for simultaneously recording—and for reproducing movements and sounds upon the film for taking the picture or scene. For this purpose the said film receives at the same time a photographic impression in the form of a wave-line which next is photographically transferred on to a metal band and then by an electrolytic process is caused to appear raised on the surface of the band so as to serve as matrix for impressing the sound-wave line on the rear of the finished positive film. At the reproduction of the cinematographic scene the fixed sound waves are by means of a stylus converted into corresponding oscillations of an electric current which through the medium of a membrane or through influence upon a flowing compressed air column or steam jet effects the reproduction of the sound

The apparatus for recording the sounds comprises two separate parts. Part 1 is electrically connected to part 2 which is mounted on the cinematograph camera.

Part 1 consist merely of a funnel and telephone transmitter with encased electric battery, and is connected to part 2 by a main and return conductor.

Part 2 the whole width of the cinematograph film is not utilized for taking the pictures there being left on an inner margin along the perforation of a small width or strip which remains unexposed and which serves for the reception of the sound-waves. A telephone receiver is encased in a thoroughly soundproof and padded capsule so as not to be influenced by extraneous sounds or by the noise produced by the working of the cinematograph. The centre of the membrane is connected with a small and light plate which is held over the said unexposed strip of the film. This plate has a very fine round aperture through which a ray of light falls on the reserved margin of the film. The plate performs side-ways movements corresponding to the oscillations of the membrane and during the advancing motion of the film beneath the aperture it receives an exposure which takes the form of a fine wave-line similar to that on a gramophone plate. In developing the film the wave-line becomes black.

TRANFERENCE OF THE SOUND WAVES ON TO THE POSITIVE FILM.

From the finished negative film the sound waves are first transferred on to a thin metal band. The latter is provided with a coat of lacquer all but a sma" strip which is coated with unexposed chromate-gelatine. This strip is then

exposed beneath the edge-strip or margin of the film, which is transparent all except the sound-wave line, the exposure rendering the chromate-gelatine all but the sound-wave insoluble. The latter is then washed out in warm water bath till the metallic sub-ground appears. Hereupon the metal band is placed in an electrolytic bath. As the band is protected up to the sound-wave line, the latter only receives a deposit of metal in the form of a raised ridge upon the metal band.

Thus prepared the metal band serves as matrix for impressing the sound-waves into the rear surface of the finished positive film by passing both together between rollers.

Producing.

The reproduction is effected on similar principles as the production. Here also is the apparatus divided into two parts. Part 1 is within the picture projecting apparatus and part 2 is near the picture screen. Part 1 converts the oscillations of a stylus-needle, which glides in the wave-line of the film, into corresponding fluctuations of an electric current which excites an electromagnet in part 2. Owing to the difficulty of properly guiding the needle or stylus it is not advisable to use a membrane for a good and loud reproduction of the sound. This is to be effected through the action upon a flowing column of compressed air or steam jet by causing the electromagnet to move a small slide or damper in a manner to impart sound fluctuations to the flowing air column.

It is to be mentioned that the recording of the sound waves should be done at a position where the film receives uniform motion, for example on the delivery drum or feed reel. Similarly, the needle of the reproducing apparatus glides on the winding drum or uniformly rotating transmitting drum. The sound waves appertaining to a picture screen on the negative are not arranged immediately at the side of same but are disposed alongside of a subsequent picture. At the impressing operation the proper displacement has to be effected.

The sound is exceedingly sensitive to variation in rotating speed as will be noticed in any gramophone, and it is necessary to obviate this specially during the producing and the reproducing operations by providing particularly large flywheels for example.

If the celluloid of the positive film be found unsuitable for the impressing of the sound-wave line it may be necessary to make the impression on some other suitable substance.

The chromate-gelatine layer on the metal band must be so thin as to be quickly acted upon by light through the whole thickness to the base. It is advantageously coloured blue so that the chemical action of the light is not weakened, and the sound-wave line clearly appears after the washing operation. To ensure that the needle of the reproducing apparatus receives proper oscillations it is necessary that the film should be well pressed down at the particular place by rollers and to be protected against lateral displacement.

The accompanying drawing shows one form of construction of the apparatus, by way of example, for carrying out the method.

Fig. 1 shows the recording device for the taking of the cinematograph picture and the wave-line, while

Fig. 2 shows the reproducing device, the film being in both cases omitted.

a, *a* (Fig. 1) is a part of the apparatus, on the right of the drawing is the outside and on the left thereof, the inside of the apparatus. *b* is the ratchet-drum of the film, moved at constant velocity. The box *c* provided at the outside encloses at the upper part a small incandescent lamp *d* and at the lower part the electromagnet *e*, with the iron diaphragm *f*.

From the centre of the diaphragm, a pin *g* leads through the wall *a* and carries at its end the little plate *h*, having a fine opening as previously mentioned.

Through the intervention of *g*, the plate *h* participates in the oscillations of the diaphragm *f* and thereby causes the beam of light from the shaft *i* to trace a wavy line on the film. The shaft *i* tapers downwards and is light-tight with exception of the fine opening in *h*. The rays from *d* are concentrated by the lens *k* and the mirror *l* reflects them at right angles downwards.

Fig. 2 is the toothed drum moved at constant velocity and 2 is the pin sliding in the wave line for reproduction of the sound. The holder 3 of the pin is similar to that of a sound box. 4 is an electrically-insulating part. The current flows over the microphonic contacts 5 comprising two fine pointed wire brushes touching each other. By the oscillations of 3 they are telescoped more or less whereby the resistance of the microphone 5 is increased and reduced so that oscillations of the current, flowing through the brushes, are produced which correspond to the engraved line of the sound waves on the film.

Having now particularly described & ascertained the nature of my said invention & in what manner the same is to be performed, I declare that what I claim is:—

The combined process for simultaneously recording (and for reproducing) movements and sound, which is characterized in that the process, by which a film for receiving the cinematographic picture serves also in recording sound waves by receiving a luminous impression in the form of a wave-line which is next photographically transferred onto a metal band and then by an electrolytic process is caused to appear raised on the surface of said band so as to serve as matrix for impressing the sound-wave on the rear of the finished positive film, is conjoint with the process for the reproduction of sound through a stylus in a wave line, and transferring its oscillations to an electric current which through the intervention of a membrane or through the influence of air or steam pressure reproduces the sound.

Dated this 25th day of June, 1917.

CHATWIN, HERSCHELL & Co.,
253, Gray's Inn Road, London, W.C. 1,
Patent Agents for the Applicant.

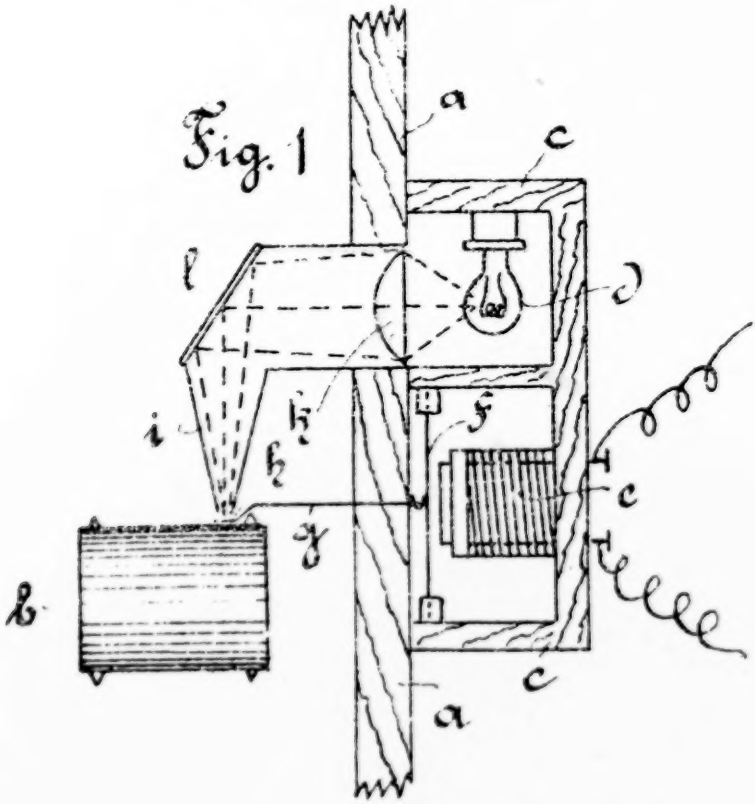

Fig. 1

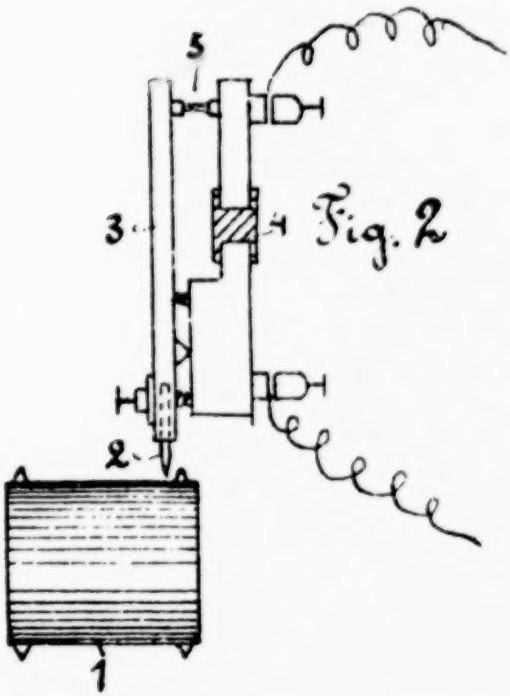

Fig. 2

The Patentee does not hold himself responsible for the Opinions

KAISERLICHES PATENTAMT.

AUSGEGEBEN DEN 20. JUNI 1914.

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PATENTSCHRIFT

№ 275551

KLASSE 57c. GRUPPE 8.

JOHN EDWARD THORNTON IN ROCHESTER, V. ST. A.

Verfahren und Vorrichtung zum Herstellen kinematographischer Films für Bilder in natürlichen Farben.

Patentiert im Deutschen Reiche vom 22. Mai 1913 ab.

Für diese Anmeldung ist gemäß dem Unionsvertrage vom 2. Juni 1911 die Priorität auf Grund der Anmeldung in Großbritannien vom 23. Mai 1912 beansprucht.

Die Erfindung betrifft ein Verfahren und eine Vorrichtung zum Entwickeln und Fertigstellen kinematographischer Films in natürlichen Farben.

Stellt man kinematographische Films der gewöhnlichen einfarbigen Art her, die beispielsweise auf die übliche lichtempfindliche Bromsilberemulsion kopiert werden, so bietet es keine Schwierigkeiten, beim Entwickeln mit der gewünschten Schnelligkeit zu arbeiten und im richtigen Augenblick den Vorgang zu unterbrechen.

Man geht dann in der Weise vor, daß man den Film in Entwicklungs-, Fixier- und Waschbäder einführt, sie genügend lange durch sie hindurch- und dann wieder hinausführt.

Handelt es sich aber darum, Films für Bilder in natürlichen Farben herzustellen aus Aufnahmen der Art, wie sie das Verfahren der deutschen Patentschrift 275320 beschreibt, so versagen die bekannten Entwicklungsmethoden, da hier Teilbilder auf einem übernormal breiten Film nebeneinander vorhanden sind.

Die verschiedenen Teilbilder werden nach dem Verfahren der erwähnten Erfindung gleichzeitig auf einen Bichromat-Gelatinefilm kopiert und entwickelt, und zwar wird jede Bildreihe mittels eines Entwicklers in einer bestimmten Farbe entwickelt oder mit einer Farbe angefärbt. Die verschiedenen Entwickler oder Farbstoffe müssen nun auf den Film möglichst gleichzeitig zur Anwendung gebracht werden, gleichwohl aber voneinander getrennt gehalten werden; auch ist zu berücksichtigen, daß einige der Flüssigkeiten länger angewandt werden müssen als andere, damit man die notwendige Farbdichte erhält; infolgedessen muß Vorsorge getroffen werden, daß der Operateur die Behandlung eines Streifens unterbrechen kann, während die Behandlung eines der anderen Streifen [illegible]h fortgesetzt wird.

Es handelt sich demnach bei der Erfindung darum, einen bewegten Film von übernormaler Breite, der mit zwei, drei oder mehr Reihen von Bildern exponiert ist, oder auf den solche Bilderreihen kopiert worden sind,

1. einem Waschprozesse zu unterwerfen mittels dessen alle löslichen Bestandteile aus dem Film ausgewaschen werden,

2. einem derartigen, sich, wie erwähnt, kontinuierlich bewegenden Film die Entwicklungsfarben zuzuführen, und zwar eine besondere Farbe bzw. einen besonderen Entwickler für jede Reihe von Teilbildern, derart, daß jede Farbe in scharf abgegrenzter

Breite aufgebracht wird, ohne daß die Farben sich überdecken.

3. hierbei dafür Sorge zu tragen, daß die Aufbringung jeder der Farben bzw. eines jeden Entwicklers aufhört, wenn die Entwicklung genügend vorgeschritten ist.

4. Maßnahmen zu treffen, um den Überschuß an Entwickler nach Beendigung der Entwicklung zu entfernen, ohne daß hierbei eine Befleckung des Films stattfindet.

5. den Film durch Anwendung von Härtungslösungen fertig zu machen.

6. den Film zu trocknen,

7. den Film mit einem Überzug zu versehen und

8. schließlich ihn zum Trocknen fertigzustellen und aufzurollen.

In der Zeichnung ist beispielsweise eine Ausführungsform einer Vorrichtung, die diesen Ansprüchen gerecht wird, beschrieben.

Fig. 1 zeigt eine Seitenansicht einer derartigen Vorrichtung, teilweise im Schnitt;

Fig. 2 ist eine Vorderansicht, teilweise im Schnitt;

Fig. 3 ist eine schaubildliche schematische Darstellung der Vorrichtung;

Fig. 4 zeigt eine besondere Ausführungsform eines Teiles der Vorrichtung, eine Rolle für die Films mit konischen Absätzen.

Bei der Vorrichtung sind ein Paar sehr lange Walzen *A* und *B* vorgesehen, die in einem Rahmen *C* montiert sind. Um die Walzen ist der Film *D* herumgewunden, so daß er schraubenförmig von der einen zur anderen wandert. Jede Walze ist mit einer Reihe von Flanschen *a* und *b* versehen, um die einzelnen Filmteile voneinander zu trennen und zu verhindern, daß sie übereinander geraten sowie um zu bewirken, daß der Film von einem Ende der Maschine zum anderen gelangt. Die Walzen *A* und *B* können zwischen den Flanschen zylindrische Form besitzen, sie können auch leicht konisch ausgebildet sein, wie dies Fig. 4 erkennen läßt. Unter der Rolle *B* sind Tröge *E* angeordnet, die dem Zwecke dienen, die Wasch-, Entwicklungs-, Fixier-, Beiz- oder anderen Flüssigkeiten aufzunehmen. In den Trögen sind in bekannter Weise Walzen *e* angeordnet, welche die Flüssigkeit auf den Film bringen, wenn sie durch den bewegten Film gedreht werden. Die Walzen *e* können aus Holz, Metall oder anderem Material bestehen. Sie sind mit einer aufsaugenden Masse überdeckt.

Handelt es sich darum, die Waschflüssigkeit auf den Film zu bringen, so kann die Walze *e* so breit sein wie der Film da selbst (oder mehr) Farbenarten gleichzeitig gewaschen werden können. Dient die Walze aber dem Aufbringen der Farbe oder des Entwicklers bzw. der Beize oder Fixierflüssigkeit, so darf die Walze oder Rolle *e* in dem Trog *E* nur so breit sein wie ein Teilstreifen. Die Tröge können, wie Fig. 3 erkennen läßt, zwei Abteilungen enthalten, damit man entweder dieselbe Farbe von zwei Stellen her zuführen kann, oder zwei verschiedene Farben oder vielleicht auch eine Farbe und eine Beize.

Zwischen den Walzen *A* und *B* kann eine Platte *F* angeordnet sein, über welche der Film *D* wandert. In der Tafel *F* kann man dann eine Füllung aus Glas *f* vorsehen, hinter der eine Lampe *G* angeordnet ist, so daß der Film beleuchtet wird und man das Fortschreiten der Behandlung leicht beurteilen kann. Längsseitig kann man farbige Streifen *H* anbringen, die den Zweck haben, die Intensität der Färbung leicht feststellen zu können.

Wie die Zeichnung erkennen läßt, können die Walzen *A* und *B* so angeordnet sein, daß der Film in gegen die Horizontale geneigter Bahn sich bewegt. Man kann sie auch so stellen, daß der Film sich horizontal oder vertikal bewegt.

Die Tröge *E* und Walzen *e* müssen so angeordnet sein, daß letztere leicht außer Kontakt mit dem Film gebracht werden können, wenn nämlich genügend Flüssigkeit auf diesen aufgebracht oder genügend Farbe von ihm absorbiert worden ist.

Die Einrichtung nach Fig. 1 zeigt zwei Tröge, die um eine Achse e^1 auf und ab geschwungen werden können. Eins der Gefäße kann Farbe, das andere Beize oder Fixierflüssigkeit enthalten. Kippt man den unteren Trog, so daß die untere Walze *e* die Berührung mit dem Film verliert, so wird die Walze des oberen Troges mit ihm in Berührung gebracht. Die Stütze *e*, die die beiden Gefäße trägt, ist mit einem Schlitz e^3 versehen, dergestalt, daß beide Walzen mit dem Film außer Kontakt kommen, wenn die Gefäße nach hinten zurückgeschoben werden. Jede beliebige andere Bewegungsanordnung kann dazu dienen, um den in Bewegung befindlichen Film mit den Walzen außer Kontakt zu setzen.

Man kann naturgemäß statt mit Walzen und Flüssigkeitsbehältern die einzelnen Flüssigkeiten auch in anderer Weise auf den Film aufbringen, z. B. durch Besprengen oder Aufwischen oder in sonst geeigneter Weise.

Bei einer anderen Ausführungsform der Vorrichtung befindet sich die Flüssigkeit nicht in einem Gefäße. Man läßt sie vielmehr in einer fernen Öffnung direkt auf die Flüssigkeit aufsaugende Walze laufen oder man setzt sie aus einem Vorratsraum mittels einer [illegible] der [illegible] mit der Walze in Berührung.

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Dort, wo es der Raum gestattet, kann der Film über eine lange Tafel hinweggehen, und es können dann die Wasch-, Entwicklungs- und Fixiervorrichtungen längs dieser Tafel in geeigneten Abständen angebracht sein.

Patent-Ansprüche:

1. Verfahren zum Herstellen kinematographischer Films für Bilder in natürlichen Farben, dadurch gekennzeichnet, daß Films von mehrfacher Breite, die zwei oder drei Teilbilderstreifen nebeneinander tragen, gleichzeitig streifenweise mit Flüssigkeiten behandelt werden.

2. Vorrichtung zum Ausüben des Verfahrens nach Anspruch 1, dadurch gekennzeichnet, daß jede der einen Teilstreifen behandelnden Vorrichtungen so angebracht ist, daß sie für sich allein außer Tätigkeit gesetzt werden kann.

3. Vorrichtung zum Ausüben des Verfahrens nach Anspruch 1, gekennzeichnet durch zwei Walzen (*A* und *B*), welche so gestaltet sind, daß der Film schraubenförmig läuft, in Verbindung mit in der Bahn des Films liegende Walzen (*e*) o. dgl., die dem sich bewegenden Film in seinen einzelnen Teilen die notwendigen Flüssigkeiten zuführen.

4. Vorrichtung nach Anspruch 3, bei welcher in der Bahn des Films eine erhellte Glasunterlage (*f*) o. dgl. angeordnet ist, über welche der Film hinweggeführt ist, um feststellen zu können, ob die Behandlung der einzelnen Bildstreifen bis zum gewünschten Grade vorgeschritten ist.

Zu der Patentschrift 275551

Fig. 1.

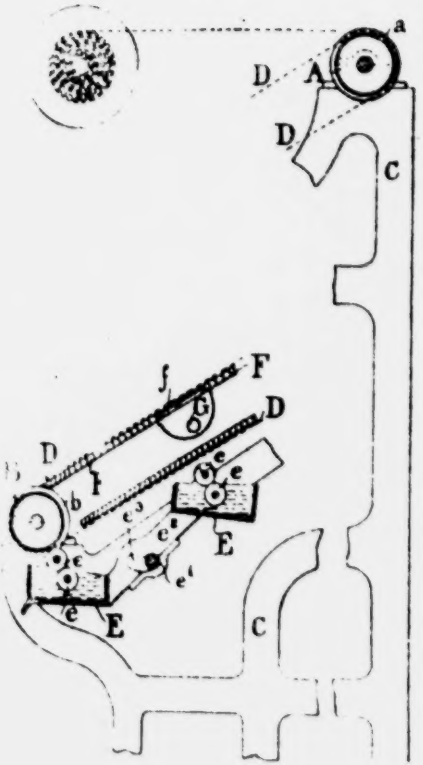


Fig. 2.

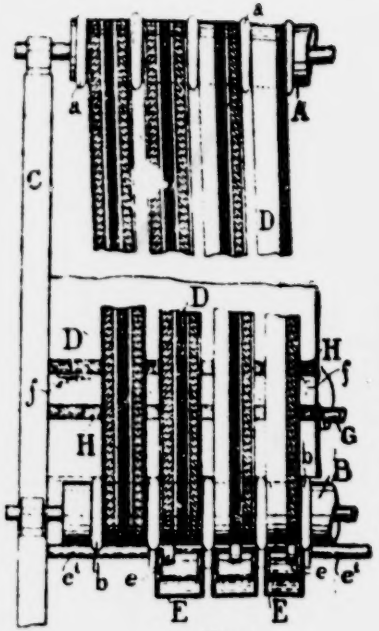
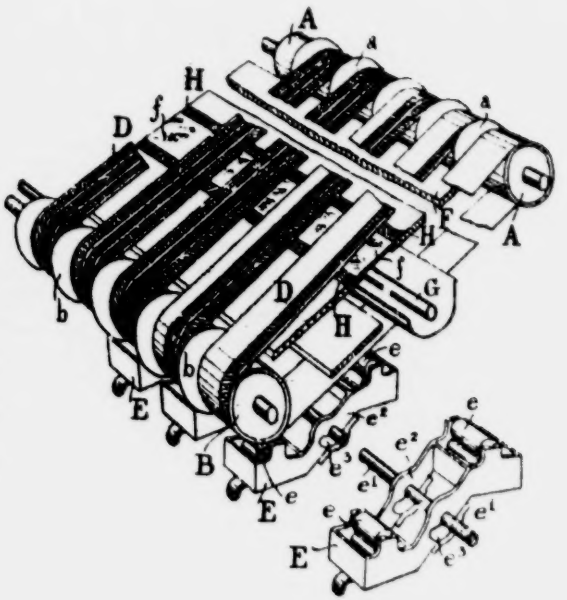


Fig. 4

Fig. 3.



Defendant's Exhibit G. 2737

TRANSLATION FROM GERMAN.

B'M

German Patent Office

LETTERS PATENT
No. 275551

Published on:
June 20, 1914.

Class 57c. Group 8.

JOHN EDWARD THORNTON IN ROCHESTER, UNITED STATES OF AMERICA. 2738

Process and device for the making of motion picture films for pictures in natural colors.
Patent in Germany as from May 22, 1913.

For this application, in accordance with the Union Treaty of June 2, 1911, priority is claimed on basis of the application in Great Britain as from May 23, 1912.

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The invention refers to a process and a device for the developing and finishing of motion picture films in natural colors.

If motion picture films of the common single color (black and white) kind are made, which, for instance, are copied on the customary light-sensitive silver bromide emulsion then no difficulties are encountered in proceeding with the developing with the desired speed, and in interrupting the process at the correct moment.

One proceeds, in this connection, in the manner that the film is introduced into the developing, fixing, and washing bath, passing it through

2740 *Defendant's Exhibit G.*

same for a sufficiently long time, and then again withdrawing it from same.

If there are, however, concerned films for pictures in natural colors, made from negatives of the kind described in the process of the German Patent 275320, then the well known developing methods can no longer be used, inasmuch as there are concerned here partial images arranged alongside of each other on a film of unusual width.

2741 The various partial images, in accordance with the process of the said invention, are simultaneously printed and developed on a bi-chrome gelatine film, each row or series of images being developed by means of a developer in a definite color or colored with one color. The different developers or colors or dyestuffs must be applied to the film, if possible, simultaneously, but must, nevertheless, be kept separate from each other; it must be also taken into consideration that some of the liquids must be applied for a longer period of time than other liquids, so that one ob-

2742 tains the required color density; on account of this, it must be seen to it that the operator can interrupt the treatment of a strip, while the treatment of one of the other strips is continued.

In the case of this invention and in connection with a moved film of exceptional width, with two, three or more rows of images exposed, or on which such rows of images have been copied, there is concerned here the question of:

1. subjecting same to a washing process by means of which all soluble constituents are washed out of the film;

2. bringing to such a film—which, as mentioned, is continuously moved—the developing colors,

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namely, a special color or a special developer for each row of partial images, in such a manner that each color is applied in a sharply limited width (extent), without the colors overlapping each other;

3. seeing to it, in this connection, that the application of any of the colors or of any developer stops when the developing process has progressed to a sufficient extent;

4. taking steps in order to remove the excess developer after the termination of the developing, without there taking place in this connection a spotting of the film;

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5. completing the film by the application of hardening solutions;

6. drying the film;

7. providing the film with a coating; and

8. finally, completing it for drying, and rolling it up.

In the drawing there is shown, by way of example, a device which complies with these requirements.

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Fig. 1 is a side elevation of such a device, partly in section;

Fig. 2 is a front view, partly in section;

Fig. 3 is a diagrammatic view of the device;

Fig. 4 is a special manner of execution of a part of the device, *i. e.*, a roller for the film with conically set off sections.

In connection with the device, a pair of very long rollers A and B is provided, which are mounted in a frame C. Around the rollers there is wound the film D so that it travels in a hellical manner from one roller to the other. Each roller

2746 *Defendant's Exhibit G.*

is provided with a row of flanges a and b, in order to separate the individual film parts from each other, and in order to prevent that they overlap or get on top of each other, so that the film reaches from one end of the apparatus to the other. The rollers A and B can be of cylindrical shape between the flanges; they can also be developed in a slightly conical or tapering manner as shown in Fig. 4.

Under the roller B there are arranged the
2747 trays E for the purpose of receiving the washing, developing, fixing, staining (mordant) or other liquids. In the trays there are arranged the rollers e which bring the liquid to the film, if they are turned by the moved film. The rollers e can be made of wood, metal or other material. They are covered with an absorbing mass.

If it is a question of applying the washing liquid to the film, then the roller e can be as broad as the film, inasmuch as all three (or more) color rows can be washed simultaneously. If the roller, however, is used for the application of the color
2748 or of the developer or of the mordant or fixing liquid, then the roller e, in the tray E, must only be as broad as a partial strip. The trays as shown in Fig. 3, can contain two compartments so that one can feed either the same color from two sides, or two different colors, or, possibly, also one color and one mordant.

Between the rollers A and B there can be arranged a plate F, over which the film D travels. In the plate or table F there can also be arranged a glass frame f, in the back of which a lamp G is arranged, so that the film can be illuminated, and so that the progress of the treatment can easily be judged. Colored strips H can

be arranged alongside, for the purpose of easily ascertaining the intensity of the coloring.

As the drawing shows, rollers A and B can be arranged in such a manner that the film moves in a path which is inclined with respect to the horizontal. One can also adjust them in such a manner that the film moves horizontally or vertically.

The trays E and the rollers e must be arranged in such a manner that the latter can be easily brought out of contact with the film, *i. e.*, when sufficient liquid has been applied to same, or if sufficient color has been absorbed by it. 2750

The device in accordance with Fig. 1, shows two trays, which can be swung up and down around a shaft e^1. One of the receptacles can contain the color, while the other can contain the fixing liquid. If one tips the lower tray so that the lower roller e comes out of contact with the film, then the roller of the upper tray is placed in contact with it. The support e, which carries the two receptacles, is provided with a slit e^3 so that both rollers come out of contact with the film, if the vessels are pushed rearward. Any desired other moving arrangement can be used in order to place the moving film out of contact with the rollers. 2751

It is, of course, also possible to apply the individual liquids—instead of with rollers and liquid receptacles—also in a different manner on the film, for instance, by spraying or rubbing on or in any other suitable manner.

In connection with another manner of execution of the device, the liquid is not contained in a receptacle. It is, rather, let to flow out of a fine opening directly on the roller which absorbs the liquid, or the liquid is absorbed from a storage

2752 *Defendant's Exhibit G.*

receptacle by means of a piece of felt or the like, which is in contact with the roller.

Where there is sufficient space, the film can pass over a long table, and in such a case the washing, developing and fixing devices can be arranged alongside of this table at suitable distances.

PATENT CLAIMS.

1. Process for the making of motion picture films for pictures in natural colors, having the
2753 distinctive feature that films of multiple width which carry two or three partial image strips alongside of each other, are treated with liquids simultaneously and in strips.

2. Device for the carrying out of the process in accordance with Claim 1, having the distinctive feature that each one of the devices treating a partial strip, is arranged in such a manner that it can be disconnected separately.

3. Device for the carrying out of the process in accordance with Claim 1, characterized by two
2754 rollers (A and B), which are arranged in such a manner that the film runs helically in connection with rollers (e) or the like arranged in the path of the film, which rollers feed the necessary liquids to the moving film in its individual parts.

4. Device in accordance with Claim 3, in connection with which there is arranged in the path of the film an illuminated glass plate or window (f) or the like, over which the film is guided, in order to ascertain whether the treatment of the individual image strips has progressed to the desired degree.

Hereto attached 1 sheet of drawings.

KAISERLICHES PATENTAMT

AUSGEGEBEN DEN 22. OKTOBER 1914.

MAR. 23 1915

PATENTSCHRIFT

Nr 279598

KLASSE 42g. GRUPPE 12.

FRIEDRICH REIMER IN NEUKÖLLN.

Verfahren zur Herstellung eines Films, der aus einem Bildband und einem Tonband besteht.

Patentiert im Deutschen Reiche vom 26. August 1913 ab.

Gegenstand der vorliegenden Erfindung bildet ein Verfahren, nach welchem Lichtbildstreifen, wie sie zur Projizierung kinematographischer Aufnahmen dienen, mit synchron angeordneten Schallwellenstreifen vereinigt werden.

Es ist bereits versucht worden, Lichtbildfilms direkt mit Schallwellenaufzeichnungen auszustatten, doch haben die Versuche zu keinem Resultat geführt, weil die Herstellung von langen Streifen mit Schallwellenaufzeichnungen zu kompliziert war, z. B. für das Einschneiden der Schallkurve in das Material eine straffe Führung des Bildbandes erforderte, das doch für die Aufnahme der Bilder leicht fortschaltbar sein mußte usw., weshalb man auch von dieser Anregung abgegangen und in der Hauptsache das synchrone Zusammenspiel von Bild und Schall durch Einschaltung von Zwischenmitteln zwischen den Apparaten zu erreichen sucht.

Nach dem neuen Verfahren wird die Herstellung des Schallwellenbandes von der des Bildfilms getrennt und beide erst nach der Fertigstellung vereinigt. Hierdurch wird die Herstellung von Bildstreifen, die sowohl Tonbilder wie Lautzeichen enthalten, erst ermöglicht. Die Herstellung des Tonbandes erfolgt z. B. in bekannter Weise von einer Schallwellenwalze oder Platte, indem ein galvanischer Abzug hergestellt wird, von dem wiederum die erforderlichen Nachbildungen durch galvanischen Niederschlag, Pressen o. dgl. genommen werden können, worauf die so gewonnenen Abzüge, wie ebenfalls bekannt ist, in Streifen geschnitten und erfindungsgemäß durch geeignete Mittel mit dem Filmband verbunden werden. Da die Aufnahmegeschwindigkeit der Apparate für Bild und Schall eine gleiche ist bzw. durch vorherige Berechnung die Bahn des Filmbandes mit der der Schallwellenkurve festgestellt werden kann, kann ein vollkommen gleichmäßiges Zusammenspiel erreicht werden, wie es durch Einschaltung von Zwischenmitteln zwischen den Wiedergabeapparaten nicht möglich ist.

Oder man verfährt in folgender Weise:

Bei der Aufnahme des Films wird gleichzeitig ein phonographischer oder grammophonischer Aufnahmeapparat in Betrieb gesetzt, dessen entsprechend große Walze oder Platte genau dieselbe Weggeschwindigkeit aufweist wie der zur Aufnahme gelangende Film. Nachdem die Doppelaufnahme stattgefunden, wird von der Walze oder Platte ein galvanischer Niederschlag (Negativ) genommen, von dem nun beliebige Abzüge (Positive) durch galvanischen Niederschlag oder Pressung gemacht werden können. Die so gewonnenen Positive werden nun zwischen den Schallwellenkurven aufgeschnitten, welche zu diesem Zwecke bei der Aufnahme entsprechenden Zwischenraum erhalten, und wird das Schallwellenband mit dem Lichtfilm durch irgendein an sich bekanntes Mittel verbunden. Die Schallwellenwalze wird sich hierzu besser eignen, da das aufgeschnittene Band ein gerades Band ohne Kurve ergibt, doch können auch aufgeschnittene Platten Verwendung finden, da die Bänder eventuell mit der Schallwellenkurvenfläche im Winkel zu der Lichtbildoberfläche vereinigt werden können.

279598

Es können auch bereits fertige Films mit dem Schallwellenband vereinigt werden, indem man während der Vorführung des Films einen Aufnahme-Sprechapparat in Betrieb setzt, der die gleichzeitig mit den Projektionsbildern durch die Akteure hervorgebrachten Laute aufpimmt.

PATENT-ANSPRUCH:

Verfahren zur Herstellung eines Films, der aus einem Bildband und einem Tonband besteht, dadurch gekennzeichnet, daß jedes Band als Einzelband für sich hergestellt und beide Bänder dann miteinander vereinigt werden.

Defendant's Exhibit G. 2761

Translation from German
B'M

Imperial German Patent Office
LETTERS PATENT
No. 279598

Issued on:
October 22, 1914.

Class 42 g. Group 12

2762

FRIEDRICH REIMER IN NEUKOLLN.

Process for the making of a film which consists of an image band and sound band.

Patented in Germany as from August 26, 1913.

The subject matter of the invention under consideration here is a process in accordance with which image strips or bands, as used for the projecting of motion picture exposures, are combined with synchronously arranged sound wave strips. 2763

It has already been tried to provide image films directly with sound wave recordings, but the experiments have not led to any result for the reason that the production of long strips with sound wave recordings was too complicated, for instance, for the reason that for the cutting or engraving of the sound curve into the material, there was required a taut guiding of the image film which, on the other hand, for the taking of

2764 *Defendant's Exhibit G.*

the images, had to be arranged in such a manner that it could easily be advanced, etc. This is also the reason why this suggestion was not followed up any further and why it is attempted to bring about the synchronous operation of picture and sound, namely, by the insertion of intermediate means between the apparatus.

In accordance with the new process, the production of the sound wave band is separated from the production of the image film, and both are
2765 only combined after their completion. In this way there is first made possible the production of film strips containing both images and sound records. The production of the sound band is made, for instance, in the well known manner, from a cylinder record or disc record in the manner that a galvanic copy is made from which, in turn, the necessary copies are made by galvanic deposits, pressing or the like, whereupon the copies thus made, in the manner which is also known, are cut into strips and, in accordance with the invention, are connected by suitable means
2766 with the film band. As the recording speed of the apparatus for image and sound is the same, or as, by a previous computation, the path of the film band with that of the sound wave curve can be ascertained, there can be obtained an absolutely uniform synchronization which is not possible by the insertion of intermediate agents between the reproduction apparatus.

Or, otherwise, the process can be carried out in the following manner:

During the recording of the film, there is at the same time placed in operation a phonographic or gramaphonic recording apparatus, the cylinder or disc record of which, which is to be of corre-

sponding size, has the same travelling speed as the film to be taken. After the double recording has taken place, a galvanic deposit (negative) is taken of the cylinder or disc record from which now any desired number of copies (positives) can be made by galvanic deposit or pressing. The positive thus obtained are now cut between the sound wave curves which, for this purpose, during the recording, receive a corresponding intermediate space, and the sound wave band is connected with the image film by any suitable means 2768
known per se. The sound wave cylinder will be more suitable for this purpose, inasmuch as the cut band will result in a straight band without curve, but also cut discs can be used inasmuch as the bands can if necessary be combined with the sound wave curve surface at an angle to the image surface.

Furthermore, already finished films can be combined with the sound wave band by starting during the demonstration of the film, a recording phonograph which simultaneously with the projected images, records the sound made by the 2769
actors.

PATENT CLAIM.

Process for the making of a film which consists of an image band and a sound band having the distinctive feature that each band is made as an individual band separately and that both bands are thereupon combined with each other.

RÉPUBLIQUE FRANÇAISE.

OFFICE NATIONAL DE LA PROPRIÉTÉ INDUSTRIELLE.

BREVET D'INVENTION.

XII. — **Instruments de précision, électricité.**
2. — Appareils de physique et de chimie, optique, acoustique.

N° 448.757

Cinématographe parlant.

M. Ignatius Hubert MacCARTY résidant aux États-Unis d'Amérique.

Demandé le 26 septembre 1912.
Délivré le 5 décembre 1912. — Publié le 10 février 1913.

La présente invention se rapporte à des vues animées parlantes, et a pour objet l'obtention de moyens pour enregistrer et reproduire simultanément des sons et des mouvements par l'enregistrement des uns et des autres sur un film photographique sensible.

L'invention est plus complètement décrite ci-après en référence au dessin annexé dans lequel :

La fig. 1 est une vue schématique montrant le mécanisme enregistreur.

La fig. 2 est une vue similaire montrant les moyens employés pour reproduire les sons et mouvements enregistrés.

La fig. 3 est une vue de détail du film.

Cette invention est relative à un cinématographe combiné avec un photographophone et son objet est de produire des vues animées parlantes.

L'invention consiste en des moyens pour produire un enregistrement photographique continu de sons parlés ou autres, sur un côté d'un film sensible, simultanément avec la prise de vues animées de ceux qui les émettent, celles-ci étant enregistrées sur l'autre côté du film. Ceci étant posé, l'objet de l'invention est de produire un film sur lequel les deux enregistrements se déroulent parallèlement ou côte à côte d'une manière continue.

L'invention vise en outre la production de moyens pour reproduire les sons et les vues enregistrés.

La fig. 1 montre la partie de l'appareil qui est employée pour l'enregistrement des vues animées et des sons. Les sons enregistrés sur le film sensible sont produits par ce qui est connu en termes techniques sous le nom d'arc chantant, lequel est produit par les vibrations reçues d'un transmetteur. Le fonctionnement de cette partie de l'appareil est le suivant :

A représente le film qui est placé dans une chambre noire de construction habituelle, employée en photographie. Deux rouleaux sont placés dans la chambre noire et le film photographique est déroulé de l'un sur l'autre avec une vitesse constante. Les rouleaux peuvent être commandés par tous moyens appropriés comme par un moteur électrique ou une manivelle, qui les actionnent à une vitesse telle que le film ait un déplacement de plusieurs mètres par seconde. Le film se déplace devant une lentille cylindrique 3 qui y concentre la lumière de l'arc B. Le film est ensuite enlevé de l'appareil et développé et fixé de la manière habituelle; le film terminé montre les variations de lumière juste en proportion de leur amplitude.

La fig. 3 montre une partie du film. Les bandes claires et sombres 4 et 5 alternatives qui donnent l'aspect de grande irrégularité.

sont en réalité excessivement régulières et en harmonie, seulement leur ordre change avec le changement correspondant des sons de la parole. Chaque son donne son groupe particulier de lignes et peut être aisément reconnu et lu sur le film photophonographique.

Les intensités de lumière de l'arc chantant B sont produites par le transmetteur C, ainsi que l'indique le schéma de la fig. 1.

5 indique une génératrice de courant continu qui est connectée par un fil 6 à l'une des bornes de l'arc B. L'autre pôle de la génératrice est connecté par un fil à l'une des bornes d'une bobine de réactance 7; l'autre borne de cette bobine est connecté par un fil 8 à la borne opposée de l'arc chantant.

Ceci complète le circuit à travers l'arc chantant et la génératrice, ce qui produit un arc constant.

Afin de faire varier la lumière de l'arc ou de faire changer son intensité dans le but d'enregistrer des ondes sonores, on intercale le transmetteur C, monté dans un circuit en dérivation qui est relié avec les bornes opposées 9 et 10 de la bobine de réactance et est muni d'une résistance variable 11, à l'aide de laquelle la quantité de courant passant par le transmetteur peut être réglée. La lumière de l'arc B dépend des variations de l'intensité de lumière qui sont proportionnelles à la quantité de courant qui est passée par le circuit shunt dans lequel le transmetteur est intercalé. Il est bien connu des hommes du metier, que quand on parle dans un transmetteur, les ondes sonores frappent sur le diaphragme de celui-ci avec une intensité variable. Ces vibrations du diaphragme du transmetteur produisent des fluctuations dans la force du courant qui y passe. Ces fluctuations du courant affectent le courant qui alimente l'arc, ce qui cause des fluctuations dans l'intensité des rayons lumineux, ces variations de lumières sont enregistrées sur le film sensible, comme représenté dans la fig. 3, la lumière intense produisant les lignes sombres en travers du film. On voit ainsi que la voix humaine ou les ondes sonores qui frappent sur le diaphragme d'un transmetteur affectent l'intensité de la lumière de l'arc B, qui à son tour enregistrée sur le film sensible et produit ce qui est connu sous le nom de phonogramme.

En produisant un phonogramme ou film de cette nature, il est nécessaire d'employer le type d'appareil photographique ou cinématographique dans lequel le film se déplace à une vitesse constante, tandis que le côté 12 du film qui prend les vues animées des acteurs ou côté du film représentant la partie cinématographique de l'appareil, nécessite l'emploi d'une lentille à éclipse 13.

De ce qui précède on voit qu'une vue animée parlante est produite en combinant les vues cinématographiques et les enregistrements photophonographiques sur un même film: la nouveauté du système consiste à enregistrer la parole ou des sons et les vues animées sur le même film. A l'aide de ces moyens les enregistrements de la voix et des vues animées sont toujours en synchronisme ce qui est très nécessaire comme cela a été prouvé par l'expérience.

Il arrive souvent qu'en enroulant le film dans une machine, certaines de ses parties sont endommagées, ce qui rend nécessaire d'en couper ou d'en enlever certaines parties. Une difficulté que l'on a rencontrée jusqu'ici avec les cinématographes parlants, dans lesquels on emploie des enregistrements phonographiques en combinaison des vues animées est le fait que si une portion du film est enlevée, pour n'importe quelle raison, aucun procédé pratique n'existe pour effacer les sons phonographiques correspondants qui accompagnent cette portion particulière de la vue animée. Ceci produit les résultats suivants:

Par exemple, si une section du film montre un homme se frottant la tête et que le phonographe marchant synchroniquement dise «Oh! ma tête», si on enlève cette section montrant l'homme se frottant la tête sur la vue animée et si on reproduit à nouveau l'image, quand le phonographe arrive à ces mots, l'homme peut se frotter la cheville. Cela produit des effets ridicules et rend le film sans valeur.

Cette difficulté est entièrement supprimée quand les enregistrements photographiques des sons et des vues animées sont combinés sur un film unique. Si une partie quelconque du film est endommagée et enlevée, les sections correspondantes des enregistrements phonographiques et cinématographiques sont nécessairement enlevées en même temps.

Comme l'arc chantant n'est pas nouveau, on ne revendique aucun arrangement parti-

culier de la source de lumière, car il est bien connu que différents arrangements ont été faits, à l'aide desquels les variations de lumière peuvent être produites; ces variations étant effectuées en faisant passer un courant électrique dans un transmetteur. A la place de l'arc chantant représenté ici, la lumière du soleil ou autre lumière peut être employée, en la disposant de telle sorte qu'elle tombe sur un diaphragme du transmetteur, qui peut être un miroir, un verre argenté, une membrane de mica, de sorte que les rayons lumineux soient réfléchis ou projetés sur le film sensible; il est bien entendu que les ondes sonores peuvent être enregistrées sur le film par différents procédés.

La fig. 2 est une vue schématique montrant un moyen employé pour reproduire les sons et les vues animées enregistrés sur le film sensible. Pour reproduire ceux-ci, on déplace le film dans le même sens que celui où il a été pris et avec la même vitesse derrière l'objectif de l'appareil de projection, tandis que la lampe de l'arc B, d'intensité de lumière constante, est alors employée comme source d'éclairage.

En regard du film on fixe un élément de pile au sélénium 14 qui est connecté en série avec une pile à élément sec 15 et avec un récepteur ou autre dispositif reproducteur des sons 16. Quand le film passe devant l'arc, les rayons de celui-ci projetés à travers le film sur la pile au sélénium varient suivant les lignes ou parties sombres et claires du film, comme représenté dans la fig. 3. Le sélénium est une substance dont la résistance augmente ou diminue suivant les variations de la lumière à laquelle elle est exposée; ces variations de lumière produisent des variations correspondantes dans le flux du courant qui passe par la pile au sélénium et au moyen du circuit shunt contenant le condensateur et le récepteur reproduit les paroles ou autres sons articulés. Simultanément avec la production ou le changement du son sur le film, la section du film ayant l'image cinématographique est projetée sur l'écran et ainsi reproduite.

Le circuit électrique passant par la pile au sélénium et le récepteur peut avoir le tracé suivant :

D'un des pôles de la pile au silénium 14, un fil 17 conduit à une borne d'une bobine de réactance 18 et de l'autre borne de cette bobine un fil 19 conduit à une borne d'une pile 15. De l'autre borne de la pile 15 un fil 20 conduit à l'une des bornes d'une bobine de réactance 21, et de l'autre borne de cette bobine de réactance un fil 22 revient à la pile au sélénium 14, ce qui complète le circuit. Le but de ces bobines de réactance 18 et 21 est d'empêcher un courant alternatif de suivre cette voie et de le confiner au circuit récepteur, tout en permettant au courant continu de passer par la pile au sélénium 14. Un récepteur de téléphone ou autre dispositif reproducteur de sons approprié 16 est shunté à la pile au sélénium 14 d'une part, par un fil 23 et de l'autre borne de ce récepteur 16 un fil 24 conduit à une borne du condenseur 25, de l'autre borne de celui-ci un fil 26 ramène à la pile au sélénium 14. Le but de ce condensateur est d'empêcher le courant direct de passer au travers du récepteur de téléphone 16 tout en permettant au courant alternatif causé par l'action des fluctuations de lumière sur le sélénium de s'écouler à travers ce récepteur et de le faire vibrer de manière à émettre des sons articulés ou autres.

RÉSUMÉ.

L'invention vise :

1° Dans un cinématographe parlant, un film sensible, des moyens pour y enregistrer photographiquement une vue animée et des moyens pour y enregistrer photographiquement la voix ou d'autres sons.

2° L'enregistrement simultané par voie photographique sur un même film de vues animées et de sons articulés ou autres en vue de la reproduction synchronique de ces vues et sons.

3° La disposition des moyens pour obtenir cette reproduction synchronique.

4° La combinaison d'un appareil cinématographique avec un mécanisme enregistreur photographique de sons, le dit mécanisme consistant en un transmetteur connecté à un arc chantant placé par rapport au film sensible, dans une position telle que les variations d'intensité de lumière de l'arc chantant peuvent être enregistrées sur le film sensible simultanément avec l'enregistrement sur une

autre partie du film, de l'image produisant le son.

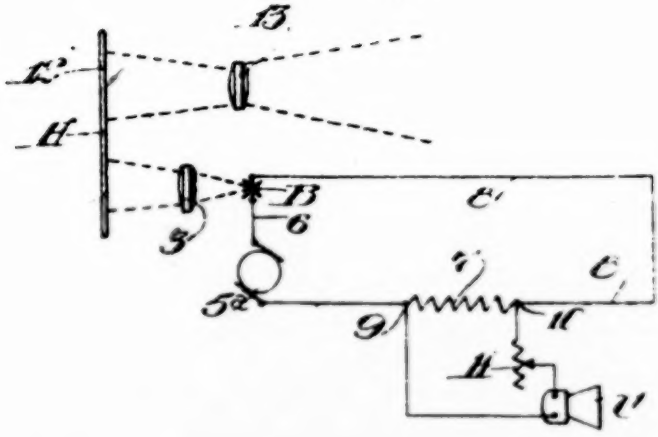
5° Un film sensible constitué par la combinaison d'enregistrements photographiques de vues animées et de sons.

James Henry MacCARTY.

Par procuration :

Ch. Post.

Fig. 1



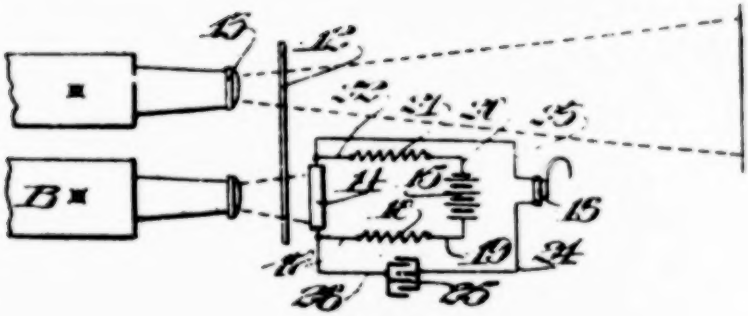


Fig. 2.

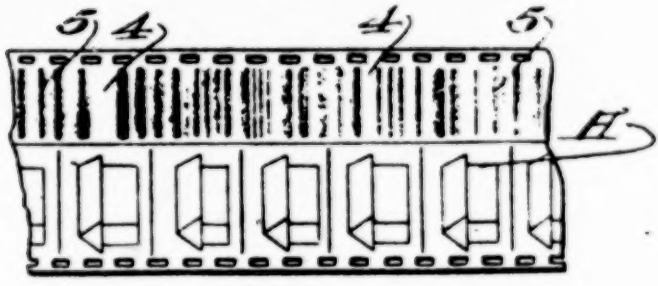


Fig. 5.

Defendant's Exhibit G. 2785

FRENCH PATENT—448,757

Applied for September 26, 1912.

Granted December 5, 1912—Published February 10, 1912.

I. H. MAC CARTY, resident of the United States.

The present invention pertains to animated talking pictures, and has as its object the obtaining of means for simultaneously recording and 2786
reproducing sounds and movements by the recording of both on a sensitive photographic film.

The invention is more completely described below with reference to the annexed diagram in which:

Fig. 1 is a diagrammatic sketch showing the recording mechanism.

Fig. 2 is a similar view showing the means employed for reproducing the sounds and movements recorded.

Fig. 3 is a detail view of the film.

This invention pertains to a cinematograph 2787
combined with a photographaphone and its object is the production of animated talking pictures.

The invention consists of means for producing a continuous photographic record of sounds spoken or otherwise, to one side of a sensitive film, simultaneously with the taking of animated pictures of those who produce the sounds, the latter being recorded at the other side of the film. This granted, the object of the invention is the production of a film on which the two recordings unroll parallel to each other or side by side in a continuous manner. The invention furthermore

2788 *Defendant's Exhibit G.*

comprises the production of means for the reproduction of the recorded sounds and views.

Fig. 1 shows the part of the apparatus employed for recording animated views and sounds. The sounds recorded on the sensitive film are produced by what is called in technical parlance the singing arc which is produced by vibrations received from a transmitter. This part of the apparatus functions as follows:

A represents the film which is placed in a dark
2789 chamber of usual construction as employed in photography. Two rollers are placed in the dark chamber and the photographic film is unrolled from one to the other at a constant speed. The rollers may be driven by any suitable means such as an electric motor or a crank, which drives them at such a speed that the film has a speed of travel of several meters per second. The film moves past a cylindrical lens 3 which concentrates upon it the light from arc B. The film is then taken from the apparatus and developed and fixed in the usual manner; the finished film shows
2790 variations of light accurate in proportion to their amplitude.

Fig. 3 shows a part of the film. The alternating light and dark bands 4 and 5 which seem to be extremely irregular are in reality extremely regular and harmonious; only their order changes with the corresponding changes of sounds of the voice. Each sound furnishes its particular group of lines and can easily and surely read on photophonographic film. The intensities of the singing arc B are produced by the transmitter C, as shown in the diagram of Fig. 1.

5^a indicates a generator of direct current which is connected by a wire 6 to one of the electrodes

of the arc B. The other pole of the generator is connected by a wire to one of the terminals of a choke coil 7; the other terminal of this coil is connected by wire 8 to the opposite terminal of the singing arc.

This completes the circuit between the singing arc and the generator, which produces a constant arc.

In order to vary the arc's light or to change its intensity in order to record sound waves, the transmitter C is shunted across the end terminals 9 and 10 of the choke coil, and equipped with a 2792
variable resistance 11 by means of which the amount of current passing through the transmitter may be adjusted. The light of arc B depends on the variations of the intensity of light which are proportional to the amount of current passed by the shunt circuit in which the transmitter is inserted. It is well known to men in the profession that when one speaks into a transmitter sound waves strike the latter's diaphragm with varying intensity. The vibrations of the diaphragm produce fluctuations in the strength of 2793
the passing current. These current fluctuations affect the current feeding the arc, which causes variations in the intensity of the rays of light; these light variations are recorded on the sensitive film as shown in Fig. 3, the intense light producing dark lines across the film. We thus see that the human voice or the sound waves which strike the diaphragm of the transmitter affect the intensity of the light of arc B, which in its turn is recorded on the sensitive film and produces what is known as a phonogram.

In producing a phonogram or film of this nature it is necessary to employ the type of photo-

2794 *Defendant's Exhibit G.*

graphic or cinematographic apparatus in which the film moves at a constant speed, whereas the side of the film 12 which takes the animated pictures of the actors or the side of the film representing the cinematographic part of the apparatus necessitates the employment of an eclipsing lens 13.

From the preceding it is seen that an animated talking picture is produced by combining the cinematographic pictures and the photophonographic records on the same film; the novelty in this
2795 system consists of recording the speech or the sounds and the animated views on the same film. By means of this the records of the voice and the animated views are always in synchronism, which is very necessary as experience has shown.

It often happens that in winding a film in a machine certain parts of it are damaged, which makes it necessary to cut it or to take out certain parts. A difficulty met hitherto in talking pictures in which phonographic records are used in combination with animated views, is the fact
2796 that if a portion of the film is cut out for any reason at all, there has been no practical procedure available for removing the corresponding phonographic sounds which accompany this particular portion of the moving picture. This has the following results:

For instance, if a section of the film shows a man rubbing his head and if the phonograph travelling in synchronism says, "Oh, my head," if this section showing the man rubbing his head is removed from the moving picture and if the picture is shown again, when the phonograph gets to these words the man may be rubbing his ankle. This produces ridiculous results and renders the film valueless.

Defendant's Exhibit G. 2797

This difficulty is entirely suppressed when the photographic recordings of sounds and moving pictures are combined on a single film. If any part of the film is damaged and cut out the corresponding sections of the phonographic and cinematographic records are necessarily removed together.

As the singing arc is not new no new arrangement of the light source is claimed, as it is well known that various arrangements have been made by means of which variations of light may 2798
be produced; these variations being affected by passing an electric current through a transmitter. In place of the singing arc shown here, the light of the sun or other light can be used, arranging it in such a manner that it falls on the diaphragm of the transmitter which may be a mirror, a silvered glass, a sheet of mica, such that the rays of light are reflected or projected upon the sensitive film; it is understood that the sound waves can be recorded on the film by different methods.

Fig. 2 is a diagrammatic view showing a method employed for reproducing the sounds and the 2799
moving pictures recorded on the sensitive film. In order to reproduce them the film is moved at the same speed and in the same direction as when it was taken behind the objective of the projecting apparatus, while the arc lamp B of constant intensity is then employed as source of light.

Facing the film there is mounted a selenium cell 14, connected in series with a dry battery 15, and with a receiver or other devise for reproducing sounds 16. When the film passes in front of the arc, the latter's rays projected through the film upon the selenium cell, vary ac-

2800 *Defendant's Exhibit G.*

cording to the lines of light and dark parts of the film, as shown in Fig. 3. Selenium is a substance whose resistance increases and decreases according to the variations of the light to which it is exposed; these variations of light produce corresponding variations in the intensity of the current passing through the selenium cell, and by means of the shunt circuit containing the receiver and the condenser, reproduce words or other articulated sounds. Simultaneously with the pro-
2801 duction or change of sound on the film the section of the film bearing the cinematographic image is projected on the screen and thus reproduced.

The electric circuit passing through the selenium cell and the receiver may follow the following path:

From one of the poles of the selenium cell 14, a wire 17 leads to a terminal of a choke coil 18 and from the other terminal of this coil a wire 19 leads to a terminal of battery 15. From the other pole of battery 15 a wire 20 leads to one
2802 of the terminals of a choke coil 21 and from the other terminal of this choke coil a wire 22 returns to the selenium cell completing the circuit. The purpose of the choke coils 18 and 21 is to prevent an alternating current from following this path and to confine it to the receiver circuit, while allowing the direct current to pass through the selenium cell 14. A telephone receiver or other suitable sound reproducing device 16 is shunted across the selenium cell 14 on one side by a wire 23 and from the other terminal of this receiver 16 a wire 24 leads to one terminal of a condenser 25, from the other terminal of which a wire 26 leads to the selenium cell 14. The pur-

pose of this condenser is to prevent the direct current from passing through the telephone receiver 16 while allowing the alternating current caused by the fluctuations of light on the selenium to flow through it and to make it vibrate in such a way as to emit articulate or other sounds. 2803

SUMMARY

The invention comprises:

1—In a talking cinematograph, a sensitive film, means for recording on it photographically a moving picture and means for recording on it photographically the voice or other sounds. 2804

2—The simultaneous recording by photographic means on the same film of moving pictures and of articulated or other sounds for the purpose of synchronized reproduction of these sounds and pictures.

3—The arrangement of means for obtaining this synchronous reproduction.

4—The combination of a cinematographic apparatus with a photographic recording mechanism for sounds, the said mechanism consisting of a transmitter connected to a singing arc placed with respect to the sensitive film in such a position that the variations of intensity of the light of the singing arc can be recorded on the sensitive film simultaneously with the recording on another part of the film of the image producing the sound. 2805

5—A sensitive film constituted by the combination of photographic recordings of moving pictures and of sounds.

DEFENDANT'S EXHIBIT H

RÉPUBLIQUE FRANÇAISE.

OFFICE NATIONAL DE LA PROPRIÉTÉ INDUSTRIELLE.

BREVET D'INVENTION.

XII. — **Instruments de précision, électricité.**
2. — Appareils de physique et de chimie, optique, acoustique.

N° 532.750

Film phonétique pour accompagnement d'images animées.

MM. Hans VOGT, Joseph MASSOLLE et Joseph ENGL résidant en Allemagne.

Demandé le 25 mars 1921, à 16 heures, à Paris.
Délivré le 21 novembre 1921. — Publié le 10 février 1922.
(Demande de brevet déposée en Allemagne le 2 avril 1919. — Déclaration des déposants.)

Dans la pratique de la cinématographie «muette», jusqu'à présent les commentaires nécessaires des images étaient donnés soit acoustiquement par des conférenciers, soit optiquement par la projection auxiliaire d'écritures, d'images intercalées ou de moyens analogues. La plupart du temps aussi, le défilé muet des images était agrémenté par le jeu d'un orchestre ou d'un orchestrion mécanique.

Les inconvénients de ces procédés d'explication et d'animation sont bien connus.

Par la cinématographie sonore, avec des procédés qui, simultanément à l'enregistrement cinématographique, permettent la fixation photographique des sons également et utilisent un moyen nouveau de reproduction électro-acoustique, les inconvénients, ci-dessus rappelés, sont supprimés. Mais en pratique on a constaté que l'enregistrement photographique simultané et synchrone des sons et des images n'est ni désirable ni faisable. D'une part, il ne serait pas avantageux de phonographier un acteur de première force en pantomime, mais affecté d'une voix médiocre. D'autre part, bien souvent, sur une scène de plein air, l'acoustique pourra être si mauvaise qu'il faut renoncer à l'enregistrement immédiat des sons produits en scène. D'ailleurs, dans les intermèdes comiques, présentant par exemple des animaux parlants, des attrapes, des scènes de confusions, etc., la fixation du son est complètement impossible.

La présente invention a pour objet un film d'accompagnement phonétique dont les photogrammes ne sont pas fondés sur les événements acoustiques concomitants de l'action photographiée, mais ont une source différente, choisie comme il faut et le plus favorablement possible. Ainsi, on pourra agrémenter des images, des cinématogrammes muets, des scènes de théâtre, etc., par une explication sonore quelconque ou par une musique appropriée.

La fabrication de ce film, qui n'a besoin que d'être relativement synchrone, pourra être opérée par le procédé suivant, donné à titre d'exemple.

Pendant l'enregistrement cinématographique de la scène originale plastique, on accouplera desmodromiquement, au mécanisme d'entraînement du film cinématographique, le tambour d'enroulement du film d'un acoustographe, distinct et séparé. Les sources phoniques servant à expliquer, agrémenter et animer l'action optique, telles que conférenciers, instruments de musique, machines à bruits de scènes et analogues, seront placées de manière acoustiquement favorable, en dehors du champ de l'objectif, et entre

ront en action, dès le début de la figuration, en accord convenable avec elle.

Quand, pendant l'enregistrement original cinématographique, pour une raison ou une autre, une tempête par exemple, l'enregistrement du film d'accompagnement est rendu impossible, on pourra y procéder à l'occasion d'une reproduction du film imagé fini, dans des conditions d'opérer analogues à celles ci-dessus exposées. Alors, le mécanisme d'entraînement de l'acoustographe serait accouplé à celui de l'appareil de projection.

Le traitement ultérieur des films imagés, après la pose, est, dans les deux cas, le même en ce qui concerne les procédés de copie, de reproduction, etc. Si le film d'accompagnement, pendant l'enregistrement, a défilé à la même vitesse que le film d'image, pour la reproduction scénique, les deux suites d'événements pourront pour des raisons de pratique, être copiées, si l'on veut, sur un même ruban de film.

En dehors des procédés qui viennent d'être détaillés, on pourra établir des phonogrammes commentateurs et animateurs, tels que des titres de film, des épîtres, des soli de musique et autres, par voie séparée, bien entendu, et les réunir sur des rubans acoustiques pour leur reproduction scénique, à la manière des films d'image.

Pour pouvoir repérer certains passages des films concordant en figuration et sonorité, il sera nécessaire, en outre, d'affecter les films correspondants de signes ou de chiffres de référence, à intervalles déterminés.

RÉSUMÉ.

Cette invention concerne un film photophonétique pour accompagnement des images ou des pantomimes, établi par éclairement transversal, présentant les particularités suivantes qui pourront être prises isolément ou en combinaison :

1° Son enregistrement indépendant des sonorités concomitantes de l'événement optique original;

2° Son impression, simultanée à l'enregistrement original cinématographique, par des sources sonores non (ou tout au plus partiellement) scéniques;

3° Son établissement au moyen de sources sonores appropriées, en vue du film d'image projeté;

4° Sa constitution, par une série convenablement accommodée de photophonogrammes, pris séparément;

5° La copie des deux séries de photogrammes des films d'image et d'accompagnement, sur un même ruban de film;

6° Le repérage en certaines places par des marques d'identité, des événements parallèles ou concordant sur les films d'images et d'accompagnement;

7° Le rapport d'entraînement des deux films assuré et ordonné par la perforation du film d'accompagnement aussi.

HANS VOGT, JOSEPH MASSOLLE
ET JOSEPH ENGL.
Par procuration :
ARMENGAUD jeune.

2812 *Defendant's Exhibit H.*

FRENCH REPUBLIC
FRENCH PATENT AND TRADEMARK OFFICE
LETTERS PATENT

XII.—Precision instruments, electricity.
No. 532,750.

2.—Apparatus of physics, chemistry, optics, acoustics.

Sound Film for Accompaniment of Motion
2813 Pictures.

MESSRS. HANS VOGT, JOSEPH MASSOLLE AND JOSEPH ENGL, residing in Germany.

Applied for on March 25, 1921, at 4:00 P. M. at Paris.

Issued on November 21, 1921.—Published on Feb. 10, 1922.

(Patent application filed in Germany on April
2814 2, 1919.—Declaration of the deponents.)

In the practical operation of "silent" motion pictures up to the present time, the comments, necessary to explain the pictures, were given either orally or by lect[illegible] optically by the auxiliary projection of t[illegible]s, of inserted images, or similar means. On most occasions, furthermore, the silent presentation of the pictures was made more pleasant by the playing of an orchestra or of a mechanical orchestrion.

The drawbacks of these processes of explanation and animation are well known.

In sound motion pictures, by means of processes which, simultaneously with the cinematograph-

ic recording, make possible also the photographic fixation of sounds and utilize a new means of electro-acoustic reproduction, the above mentioned difficulties are eliminated. However, in practical operation it has been found that the simultaneous and synchronous photographic recording of sounds and of images is neither desirable nor feasible. On the one hand, it would not be advantageous to make a phonograph record of a man who may be excellent in pantomime but who has only a mediocre voice. On the other hand, in connection with a scene taken in the open, very often the acoustics may be so bad that it may be necessary to dispense with the simultaneous recording of the sounds produced at such scene. Furthermore, in connection with comical strips, representing, for instance, talking animal, tricks, scenes of confusion, etc. the fixation of the sound is absolutely impossible.

The present invention refers to a film with phonetic accompaniment, the photograms of which are not based on the concomitant acoustic events of the photographed action, but have a different source, as properly and as favorably selected as possible. In this way one can improve images, silent motion pictures, theatrical scenes, etc. by any sound explanation or by suitable music.

This film, which only needs to be relatively synchronous, may be made in accordance with the following process, given by way of example.

During the motion picture recording of the original plastic scene one can couple in a positive manner to the motion picture film driving mechanism, the film winding drum of a separate and distinct acoustograph. The phonic sources serving to explain, make more interesting and enliven

2818 *Defendant's Exhibit II.*

the optic action, such as lecturers, musical instruments, sound machines for theatrical scenes, etc., are placed in an acoustically favorable manner, outside of the field of the objective lens, and will enter into action upon the starting of the show, in suitable agreement with same.

When during the original motion picture recording, for one reason or another, for instance, by a storm, the recording of the accompanying film is made impossible, one can proceed there-
2819 with at the time of the reproduction of the finished picture film, under operating conditions which are similar to those explained above. Then, the driving mechanism of the acoustograph will be coupled to that of the projection apparatus.

The subsequent treatment of the picture films, after the exposure, is, in both cases, the same as far as the printing process, reproduction process, etc. are concerned. If the accompanying film, during the recording, has run off at the same speed as the photographic picture film, for the scenic reproduction, the two different parts can,
2820 for practical reasons, be copied, if this is desired, on the very same film band.

Aside from the processes which have been described above, one can also make commenting and animating phonograms such as film titles, headings, musical solos, separately, of course, and join them on acoustic films for their scenic reproduction, in the same manner as the picture.

In order to be able to mark certain passages of the films that are in agreement as to picture and sound, it is necessary, furthermore, to make on the corresponding films reference signs or marks at definite intervals.

Defendant's Exhibit H. 2821

PATENT CLAIMS

This invention refers to a photo-phonetic film to accompany images or pantomime, produced by tranverse light markings, and showing the following characteristic features which can be taken advantage of either separately or in combination:

1. Its independent recording of concomitant sounds of the original optic event;

2822

2. Its impression, simultaneous with the original motion picture recording, by sound sources which are not scenic (or, at least, are only partially scenic);

3. Its establishment by means of suitable sound sources, in sight of the projected picture films;

4. Its formation by a suitably arranged series of photophonograms, taken separately;

5. The copying of two series of photograms of the picture and accompaniment films on the same film band; 2823

6. The marking at certain places by identification marks, of parallel or agreeing events on the picture and accompanying films;

7. The driving relation of the two films is assured and made positive also by the perforation of the accompaniment film.

HANS, VOGT, JOSEPH MASSOLLE & JOSEPH ENGL,
By ARMENGAUD, JR., Agent.

DEFENDANT'S EXHIBIT J

NUMBER (Series of 1913)

185332 ✓

1921

(EX'R'S BOOK) 43 – 115

DIV. 7

PATENT No. 1489314

Name Lee de Forest ✓

Assignor by mesne assigts. to De Forest Phonofilm Corporation, of Jersey City, N.J., a corp. of Delaware.

APR 8 1924

Of New York

County of

State of New York

Invention Recording Sound

PARTS OF APPLICATION FILED.

	ORIGINAL	RENEWED
Petition	July 16, 1921	, 192
Affidavit	" " , 1921	, 192
Specification	" " , 1921	, 192
Drawing	" " , 1921	, 192
Photo Copy	, 192	, 192
First Fee Cash $15	July 16, 1921	, 192
" " Cert.	, 192	, 192
Appl. filed complete	July 16, 1921	, 192
		, 192
Examined and Passed for Issue	March 4, 1924	, 192
Exr. Div. 7		Exr. Div.
Notice of Allowance March 6	1924	, 192
Final Fee Cash $20	mar 8, 1924	, 192
" " Cert.	, 192	, 192
Patented	APR 8-1924	, 192

filed

Division of Appl. No. 8

Attorney Darby & Darby, St Paul Building New York N.Y.

Associate Attorney

(No. of Claims Allowed 4) Print Claims 1 in O. G. (Cl. 88 12)

Title as Allowed Recording Sound

Div 23

1921
SPATENT O

PETITION

314

To the Commissioner of Patents:

The petition of LEE de FOREST, a

citizen of the United States, residing at New York

in the County of New York State of New York

and whose Post Office address is 1415 Sedgewick Ave., New York City

prays that Letters Patent may be granted to him for improvement in

RECORDING SOUND

as set forth in the annexed specification.

And he hereby appoints DARBY & DARBY, of St. Paul Building, 220 Broadway, New York City, N. Y., a firm composed of Samuel E. Darby, Walter A. Darby, Samuel E. Darby, Jr. and William C. Gerdsen his attorneys, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to sign the drawings, to receive the Patent, and to transact all business in the Patent Office connected therewith.

Signed at New York in the County of New York and State of New York this 14th day of July 1921

Inventor's Full Name Lee de Forest

[redacted]

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN that I, LEE de FOREST, a citizen of the United States, residing in the City of New York, County and State of New York, have made a certain new and useful invention in the art of RECORDING SOUND, of which the following is a specification.

This invention relates generically to the art of recording sound and more specifically where such record is obtained photographically for use in connection with photographic sound records such as films or the like, and is especially adaptable for use in connection with the art of motion picture photography.

The object of the invention is to provide means which are simple, economical and efficient for photographing sound record on films.

A further object of the invention is to provide means which are highly effective for accurately recording sounds on the marginal edges of a standard motion picture film.

Further objects of the invention will appear more fully hereinafter.

The invention consists substantially in the con-

Div 23

1421
SPATENT O

PETITION

314

To the Commissioner of Patents:

The petition of LEE de FOREST, a

citizen of the United States, residing at New York

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Signed at New York in the County of New York and State of New York this 14th day of July 1921

Inventor's Full Name { Lee de Forest

3

S P E C I F I C A T I O N

a

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN that I, LEE de FOREST, a citizen of the United States, residing in the City of New York, County and State of New York, have made a certain new and useful invention in the art of RECORDING SOUND, of which the following is a specification.

This invention relates generically to the art of recording sound and more specifically where such record is obtained photographically for use in connection with photographic sound records such as films or the like, and is especially adaptable for use in connection with the art of motion picture photography.

The object of the invention is to provide means which are simple, economical and efficient for photographing sound record on films.

A further object of the invention is to provide means which are highly effective for accurately recording sounds on the marginal edges of a standard motion picture film.

Further objects of the invention will appear more fully hereinafter.

The invention consists substantially in the con-

variation, combination, location and relative arrangement of parts and the method employed in connection therewith, all as will be more fully hereinafter set forth, as shown by the accompanying drawings and finally pointed out in the appended claims.

Fig. 1 is a diagrammatic view of a sound record embodying the principle of my invention.

Fig. 2 is a similar view showing the sound record applied to the marginal edge of the motion picture film in accordance with my invention.

Fig. 3 is a diagrammatic view illustrating the principle involved in recording the sound waves photographically, in accordance with my invention, on the marginal edge of a standard motion picture film.

The same part is designated by the same reference character wherever it occurs through the several views.

In my co-pending application, Serial No. 391,705, filed June 21, 1920, I show and describe methods for photographing sound-produced fluctuations of a source of light upon one or both margins of a standard motion picture film either outside or directly inside the intermittent feed perforations of the said film.

I find that if the original photographs of such sound-controlled light fluctuations be made large so that the width of the maximum amplitude of such photographic track be, say one-half inch or more, a more exact and faithful photograph containing any details of the finest light variations produced by sound waves will be obtained. For use as a sound record per se this type of record is satis-

factory, but as is readily apparent it would be too large a record to use in connection with a motion picture film or even used independently therefrom and therefore necessitating the various problems of synchronism which have always been considered, and still are considered to be the objectionable problems in this art. In accordance with my invention, however, I produce the high accurate and definite sound record on a film, for example, as shown in Fig. 1, and therewith reduce photographically the record thus obtained and print the same on one or both marginal edges of the motion picture film as shown in Fig. 2.

In the production of the photographic sound record of Fig. 1 it will be observed that the record is symmetrical on both sides of the axis thereof and it will readily be apparent that a high efficient and efficient record can be obtained by photographing the two sides [illegible] on opposite sides of the axis [illegible] on the marginal edge. This is accomplished, as set forth in my invention, in the manner [illegible] Fig. 3 wherein the sound record film 2 containing the sound record is passed between a [illegible] and arranged that the [illegible] of the film 2 is reflected [illegible] and the record on the other side of the film is reflected in the opposite direction by means of [illegible]. It will, of course, be understood that [illegible] affected by the sound record 3 [illegible] the respective prisms 4 and 5. The [illegible] selected by prisms 6 and 7 [illegible] in parallel lines through [illegible] which the motion picture film 10, [illegible] the picture spacing 11 thereof and [illegible] marginal edges

thereof orunexposed as to its entire surface, is located. Means are provided to reduce, in size, the sound record 3 contained on its film 2, to the necessary size to be accurately and completely recorded on the marginal edges 12 of the film 10. This means may comprise suitable lenses or preferably a combination of a convex lens with the prisms 6 and 7, as shown. By means of this arrangement it will readily be apparent to those skilled in the art that the large, clear, distinct sound record 3 contained on its film 2 may be accurately reproduced in smaller, but nevertheless complete detail on one or both marginal edges 12 of the motion picture film, to thereby enable utilization of the space of the film contained between the intermediate feed perforations 13, and the edge or edges thereof.

It will also be readily apparent to those skilled in the art that by suitable location of the prisms 4, 5, 6, 7, and the orifices 8 of the casing 9, the reproduction of the sound record may be effected on any other desired part of the film. By suitable variation in the form of the prisms 6 and 7, or the utilization of suitable lenses, the original sound record may be reduced in size, reproduced as of the same size or enlarged, as desired.

Many other modifications and changes in details will occur to those skilled in the art without departing from the spirit and scope of my invention as defined in the claims, but having now set forth the objects and nature of my invention, and having shown and described structures embodying the principles thereof and illustrating the method employed in accordance therewith, what I claim as new and useful, and of my own invention, and desire to secure by Letters Patent, is:-

1. The method of producing sound and picture records which comprises photographing simultaneously upon separate sensitized surfaces the picture and the sound, and re-photographing the sound record thus obtained on the picture record.

Cancelled per A

2. The method of producing sound and picture records which comprises photographing simultaneously upon separate sensitized surfaces the picture and the sound, reducing the sound record thus obtained in one dimension, and re-photographing the same on the desired portion of the picture record.

3. The method of producing sound and picture records which comprises photographing simultaneously upon separate sensitized surfaces the picture and the sound, reducing the sound record thus obtained in one dimention, and simultaneously re-photographing the same on the desired portion of the picture record.

---

1. The method of producing talking moving pictures on the same film which comprises photographing simultaneously upon separate films the picture and the sound, and photographing the sound record on an unexposed portion of the picture film.

2. The method of producing talking moving pictures on the same film which comprises photographing simultaneously upon separate films the picture and the sound, reducing the size of the record, and photographing the reduced sound record upon an unexposed portion of the picture film.

3. The method of producing talking moving pictures on the same film which comprises photographing simulta-

eously upon separate films the picture and the sound, and photographing the sound record on an unexposed portion of the picture film between the marginal edge and the sprocket perforations thereof.

4. The method of producing talking moving pictures on the same film which comprises photographing simultaneously upon separate films the picture and the sound, reducing the size of the record, and photographing the reduced sound record upon an unexposed portion of the picture film between the marginal edge and the feed sprocket perforations thereof.

5. The method of combining photographic sound and picture records which comprises photographing a reduction of the sound record on an unexposed portion of the picture record.

cancelled per B

9. The method of producing sound and picture records which comprises photographing simultaneously upon separate sensitized surfaces the picture and the sound, dividing the sound record through the axis thereof, and reproducing the divisional portions thereof on the picture record.

Cancelled per B

10. The method of producing talking moving pictures on the same film which comprises photographing simultaneously upon separate films the picture and the sound, dividing the sound record through the axis thereof, and rephotographing the divisional portions thereof on the picture record.

11. The method of producing talking moving pictures on the same film which comprises photographing simultaneously upon separate films the picture and the sound, dividing the sound record through the axis thereof, and rephotographing the divisional portions thereof on the picture record.

In testimony whereof I have hereunto set my hand on this 14th day of July, A. D., 1921.

Lee de Forest.

OATH

County of Bronx
State of New York } ss.

LEE de FOREST

the above named petitioner being duly sworn, (affirmed), deposes and says that he is a citizen of the United States and resident of New York in the County of New York and State of New York that he verily believe himself to be the original, first and sole inventor of the improvement in RECORDING SOUND

described and claimed in the foregoing specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof, or patented or described in any printed publication in any country before his invention or discovery thereof, or more than two years prior to this application, or in public use or on sale in the United States for more than two years prior to this application; that said invention has not been patented in any country foreign to the United States on an application filed by him or his legal representatives or assigns more than twelve months prior to this application; and that no application for patent on said improvement has been filed by him or his representatives or assigns in any country foreign to the United States.

Inventor's Full Name } Lee de Forest

Sworn to and subscribed before me this 14th day of July 1921 A. D., 1921.

Margaret M. Norton
Notary Public

#11

7 Room 312 V Paper No. 2

Address only The Commissioner of Patents, Washington, D. C. and not any official by name

All communications respecting this application should give the serial number, date of filing, title of invention, and name of the applicant.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON Dec. 7, 1921

U. S. PATENT OFFICE DEC 7 - 1921 MAILED

Darby & Darby
St. Paul Bldg.
New York, N. Y.

Please find below a communication from the EXAMINER in charge of the application of

Lee de Forest, filed July 16, 1921, Recording Sound,
Serial No. 485,332

Thomas E. Robertson
Commissioner of Patents

Claim 1 is rejected on

Craig 1,260,337 Mar. 26, 1918 88-16.2

Claims 2, 3, 5 and 7 are rejected as old combinations in view of Craig. The invention, if any, is in the method of recording the sound and has nothing to do with the method of synchronizing the sound and picture records. The method of recording the sound should be claimed per se.

Claims 4 and 6 are rejected on Craig in view of French patent to

Canton 459,537 ~~May~~ Sept 5 1913 (1 sheet) 88-16.2

It would not be invention to put the sound record in the place shown in Fig. 5 of Canton.

Claim 8 is rejected as not involving invention over Craig. It is immaterial whether the original or a reduction is used.

Claim 9 appears allowable, subject to the requirement for division infra.

Claims 10 and 11 are rejected as not reading on the disclosure. The portion is not reproduced.

Claims 1, 4 and 6 are for rephotographing the original on the sound record.

Claims 2, 3, 5, 7 and 8 are for rephotographing a reproduction.

Claims 9, 10 and 11 are for a method which involves rephotographing a part of the original record.

Division is required between claims 1, 4 and 6, claims 2, 3, 5, 7, and 8 and claims 9, 10 and 11. See ex parte Eagle, 1871 C. D. 137.

W.J.W.

Examiner.

MAIL ROOM
OCT
25
1922
U.S. PATENT OFFICE

Motion 23

IN THE UNITED STATES PATENT OFFICE.

Hon. Commissioner of Patents,
Washington, D.C.

7

S i r :-

In the matter of the application of LEE DE FOREST, filed July 16, 1921, for RECORDING SOUND, Serial No. 485,382, and in response to the Examiner's letter dated December 7, 1921, please amend as follows:-

Cancel claims 1 to 3

Renumber claims 4 to 8 as claims 1 to 5.

Cancel claims 9, 10 and 11.

REMARKS.

Favorable reconsideration is respectfully requested on the claims retained in this case. Obviously these claims overcome the Craig patent, for it is a physical impossibility for the Craig arrangement to permit the accomplishment of applicant's invention as defined in the claims. Furthermore, the rephotographing step in the process is a step which is not present in the art cited.

Favorable reconsideration is likewise respectfully requested on the question of division between the claims now retained in the case. It is believed that these claims are properly in the case. Claims 9, 10 and 11, however, have been withdrawn from the case, ~~xxxxxx~~ pursuant to the Examiner's requirement, and will form the subject-matter of a separate application. The early allowance of the applica-

tion as now presented is respectfully requested.

Very respectfully,

Dann & Dann

Attorneys for applicant.

Dated: New York, N.Y.,

October 23, 1922.

Mr. 7 Room 512

Address only "The Commissioner of Patents, Washington, D. C." and not any official by name.

260

Paper No. 4

All communications respecting this application should give the serial number, date of filing, title of invention, and name of the applicant.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON March 24, 1923.

Darby & Darby,

St. Paul Building

New York, New York

U. S. PATENT OFFICE
MAR 24 1923
MAILED

Please find below a communication from the EXAMINER in charge of the application of

Lee de Forest, filed July 16, 1921, Recording Sound, Serial No. 485,332

Thomas E. Robertson
Commissioner of Patents.

Reconsidered as amended Oct.25, 1922.

Claims 1 to 4 appear allowable.

Claim 5 is rejected on Craig. The unexposed portion of the picture record is not necessarily the original record but might be an unexposed portion of a print.

This claim is further rejected on Figure 5 of the French patent to Canton Barter 459,937, Sept. 8, 1913 (88-16.2) 1 sh.

There is no invention in reducing the size of the record.

WJW

Examiner

U. S. Patent Office
MAR 3 1924
DIVISION VII

IN THE UNITED STATES PATENT OFFICE

7

Hon. Commissioner of Patents,
Washington, D. C.

S i r:

In the matter of the application of LEE DeFOREST, for Recording Sound, filed July 16, 1921, Serial No.485,338, and in response to the Office letter dated March 24, 1923, please amend as follows:

Cancel claim 5.

R E M A R K S

An early allowance of the application as now presented is respectfully requested.

Respectfully,

Daly & Daly
Attorneys for applicant

Dated:
New York, N.Y.,
February 27, 1924.

INTERFERENCE.

Interference No. ~~53103~~ *Paper No.* 6.

Name, Dee deForest

Serial No. 485,332. Patent No. 1,489,514.

Title, Recording Sound.

Filed, July 16, 1921. Patented April 8, 1924.

Interference with Vogt et al.

DECISIONS OF

Law Examiner, _____ *Dated,* _____

Ex'r of Interferences, Adverse *Dated,* July 14/28

Board, _____ *Dated,* _____

Commissioner, _____ *Dated,* _____

REMARKS:

This should be placed in each application or patent involved in interference in addition to the interference letter by Primary Examiner

Forwarded from 7 Div. to Examiner of Interferences
November 2, 1925

-213-

Paper No. 7
(INTERFERENCE)

DEPARTMENT OF [redacted] COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON, D. C.

(Copy mailed patentee and assignee).

PATENT OFFICE
NOV 10 1925
MAILED

Darby & Darby
St. Paul Bldg.
New York City.

Please find below a copy of a communication from the Examiner concerning the patent granted April 8, 1924, #1,489,314, to Lee DeForest, on Serial No. 485,332, filed July 16, 1921; for RECORDING SOUND.

Very respectfully.

Room No. 106.

ADDRESS ONLY
THE COMMISSIONER OF PATENTS
WASHINGTON D. C.

Thomas E. Robertson.
Commissioner of Patents.

53103

The case, above referred to, is adjudged to interfere with others, hereafter specified, and the question of priority will be determined in conformity with the Rules.

The statement demanded by rule 110 must be sealed up and filed on or before JAN4 1926 *, with the subject of the invention, and name of party filing it, indorsed on the envelope. The subject-matter involved in the interference is*

1. The method of producing talking moving pictures on the same film which comprises photographing simultaneously upon separate films the picture and the sound, and photographing the sound record on an unexposed portion of the picture film .

2. The method of producing talking moving pictures on the same film which comprises photographing simultaneously upon separate films the picture and the sound, and photographing the sound record on an unexposed portion of the picture film between the marginal edge and the sprocket perforations thereof.

This interference involves your patent, above identified, and

An application for Process for Producing Combined Sound and Picture Films, filed by Hans Vogt, Joseph Massolle and Josef Engl, of 49 Babelsbergerstrasse, Berlin-Wilmersdorf, Germany, 60 Cunostrasse, Berlin-Grunewald, Germany, and 63 Hohenzollerndamm, Berlin-Grunewald,

J 18

Germany, whose attorneys are Ward, Crosby & Smith, of 233 Broadway, New York City, and whose assignee is Tri-Ergon Limited, Zurich, Switzerland.

The relation of the counts of the interference to the claims of the respective parties is as follows:

Counts	Vogt et al.	DeForest
1	3	1
2	4	3

Counts Compared.

Examiner, Division 7

J19

DEFENDANT'S EXHIBIT L

DEUTSCHES REICH

AUSGEGEBEN
AM 2. FEBRUAR 1923

REICHSPATENTAMT

PATENTSCHRIFT

№ 368383 —
KLASSE 57a GRUPPE 37
(V 16431 VI/57a²)

LIBRARY
APR 14 1923
U. S. PATENT OFFICE

**Hans Vogt in Berlin-Wilmersdorf,
Joseph Massolle und Dr. Joseph Engl in Berlin-Grunewald.**

Verfahren zum Herstellen von Filmen mit Bildreihen und photographierter Tonschrift.

Patentiert im Deutschen Reiche vom 15. April 1921 ab.

Beim Herstellen sprechender Filme, bei denen auch die Töne auf photographischem Wege aufgezeichnet werden, ist es insbesondere aus Betriebsgründen von großem Vorteil, die Tonschrift und die Bildreihe auf einen gemeinsamen materiellen Träger (Film) aufzubringen. Es ergeben sich aber infolge der bei der kinematographischen Aufnahme schwankenden Lichtverhältnisse häufig Unterschiede im Belichtungsgrad der Bromsilberschicht, und zwar in der Weise, d. h. die Bildreihe über- bzw. unterbelichtet wird. Da der gleiche Film aber auch nahe an der Bildreihe die immer normal belichtete Tonzeichenreihe trägt, lassen sich bei kombinierten Negativen diese Unterschiede durch Entwicklung, Abschwächen, Verstärken usw. nicht ausgleichen. Sie lassen sich nur dadurch beheben, daß die unter- bzw. überbelichteten Negativstellen eine getrennte, entsprechend abgepaßte Behandlung erhalten. Technisch ist dies so gut wie unmöglich, solange sich die beiden Reihen auf dem gleichen Film befinden.

Erfindungsgemäß wird diese Schwierigkeit dadurch beseitigt, daß das Entwickeln der Negative getrennt erfolgt. Das Aufnehmen kann hierbei entweder auf zwei Filmen geschehen oder auf einem, der aber vor dem Entwickeln geteilt wird. Der Synchronismus wird in beiden Fällen durch die Perforation und durch entsprechende Marken gewährleistet.

Die Herstellung der Positivfilme kann erfolgen, indem man die beiden Negativfilme, vorteilhaft nacheinander, auf den gleichen Positivfilm kopiert. Man kann aber auch die beiden Negativfilme vorher der Länge nach miteinander verkleben und dieses so gewonnene kombinierte Negativ wie üblich kopieren.

Patent-Ansprüche:

1. Verfahren zum Herstellen von Positivfilmen, welche Bildreihen und photographisch aufgenommene Tonschrift enthalten, dadurch gekennzeichnet, daß die Negative getrennt entwickelt werden.

2. Verfahren gemäß Anspruch 1, dadurch gekennzeichnet, daß die Aufnahme der Tonzeichen und der Reihenbilder auf einen gemeinsamen Film erfolgt, der nachher getrennt wird.

3. Verfahren gemäß Anspruch 1, dadurch gekennzeichnet, daß die Negative nach erfolgter Behandlung der Länge nach miteinander vereinigt werden.

2881

Defendant's Exhibit L.

GERMAN PATENT
No. 368,383

Published Feb. 2, 1923

Hans Vogt in Berlin—Wilmersdorf
Joseph Massolle and Dr. Joseph Engl in Berlin

Method of producing films with image and photographed sound

2882

Patent in Germany since April 15, 1921

In producing talking films when also sound is to be recorded by photographic process, it is for practical reasons of big advantage to record sound and image on one single material carrier (Film).

But on account of changing lighting conditions, when pictures are taken, there will be often differences in exposure of the silver-bromide coat 2883
and that in a way, that the image will be over— or under—exposed. As the same film carries also the always normally exposed sound track, it is impossible to remedy this difference through development, reducing, increasing, etc. It can only be remedied so that the under—resp. over—exposed parts of the negative receive a separate especially fitted treatment. Technically is this almost impossible, as long as images and sound are on the same film.

According to invention this difficulty will be removed by developing the negative separately.

2884 *Defendant's Exhibit L.*

The taking can be done either on two films or on one, which will be divided before developing. The synchronism will in both cases be guaranteed by the perforation and by corresponding marks.

The printing of the positive films can be done by printing both negative films favorable one after the other on the same positive film. It can also be done by pasting both negative films lengthwise together and then making a print from this combined negative in the usual way.

2885 Patent Claims:

1. Method of producing positive films, which carry image and photographed sound, in that way characterized, that the negatives are separately developed.

2. Method according to claim 1 in that way characterized that the taking of sound and image is done on one film, which is afterwards divided.

3. Method according to claim 1 in that way characterized that the negatives after finished
2886 treatment are lengthwise combined.

DEFENDANT'S EXHIBIT M

B e s c h e i n i g u n g.

Die angehefteten Stücke sind eine richtige und genaue Wiedergabe der Unterlagen des Patents 368 383. Das Patent ist auf die " Tri-Ergon Akt.-Ges. " in Zürich (Schweiz) umgeschrieben worden.

Berlin, den 26.Oktober 1932.

Der Präsident des Reichspatentamts.

I.V.

L. Harling

Patent 368 383

C.R. F o r t h,
Oberingenieur.

P.A. 204110. 14.4.21.

Tempelhof, den 13.April 1921.
Albrechtstr. 104.

Patentanmeldung.

An das

Reichspatentamt,

Berlin SW. 61.

Der Unterzeichnete meldet hierdurch eine Erfindung der Herren

Ingenieur Hans Vogt, Wilmersdorf, Babelsbergerstr. 49,
Physiker Dr. Joseph Engl., Grunewald, Orberstr. 17 und
Ingenieur Joseph Massolle, Grunewald, Cunostr. 60

an, betreffend

"Verfahren zur Herstellung
kombinierter Tonbildfilme"

und beantragt die Erteilung eines Patentes.

Die Anmeldegebühr im Betrage von M.80.— wird gleichzeitig hiermit bei der Kasse des Reichspatentamtes eingezahlt.

Dem Antrage liegen bei:

1 Beschreibung nebst Patentansprüchen,

1 Abschrift der Beschreibung und Patentansprüche,

1 Empfangsbestätigung (frankierte Postkarte),

1 von den Anmeldern auf mich ausgestellte Vertretervollmacht.

Es wird beantragt, nach Beschlussfassung die Bekanntmachung der Anmeldung auf vorläufig 3 Monate auszusetzen.

gez. Unterschrift.

1 Anlagen.

m/2

C. ... f ... t ...,
Ober...ingenieur.

~~P.A. 284110. 14.4.21.~~

Tempelhof, den 13.April 1921.
Albrechtstr. 104.

Patentanmeldung. P.A. 327706. 15.6.21.

"Verfahren zur Herstellung kombinierter Tonbildfilme".

Bei ~~der~~ Herstellung sprechender Filme ist es insbesondere aus Betriebsgründen von grossem Vorteil, die Tonzeichenreihe und die Bildreihe auf einen gemeinsamen materiellen Träger (Film) aufzubringen. ~~Bei diesem Verfahren~~ Es ergeben sich aber infolge der bei der kinematographischen Aufnahme schwankenden Lichtverhältnisse häufig Unterschiede im Belichtungsgrad der Bromsilberschicht und zwar in der Weise, dass die Bildreihe über- bezw. unterbelichtet wird. Da der gleiche Film aber auch nahe an der Bildreihe die immer normal belichtete Tonzeichenreihe trägt, lassen sich bei kombinierten Negativen diese Unterschiede durch Entwicklung, Abschwachen, Verstärken etc. nicht ausgleichen. Sie lassen sich nur dadurch beheben, dass die unter- bezw. überbelichteten Negativstellen eine getrennte, entsprechend abgepasste Behandlung erhalten. ———————————————

——— Technisch ist dies so gut wie unmöglich, solange sich die beiden ~~Ereignis~~reihen auf dem gleichen Film befinden.

Erfindungsgemäss wird diese Schwierigkeit dadurch beseitigt, dass ~~zur Herstellung der Negative entweder ganz~~ das Entwickeln der Negative getrennt erfolgt ~~Das Aufnehmen kann hierbei entweder auf zwei Filmen~~ ~~lich getrennte Filme vorgesehen sind oder solche, die bei~~ ~~gleichem oder auf einem der aber~~ ~~der Aufnahme wohl noch zusammenhängen,~~ vor dem Entwicklung ~~gezeigt wird~~ ~~aber auseinander getrennt werden~~. Der Synchronismus wird in beiden Fällen durch die Porforation und durch entsprechende Marken gewährleistet.

Die Her-

Die Herstellung der Positivfilme kann erfolgen, indem man die beiden Negativfilme, vorteilhaft nacheinander, auf den gleichen Positivfilm kopiert. Man kann aber auch die beiden Negativfilme vorher der Länge nach miteinander verkleben und dieses so gewonnene kombinierte Negativ wie üblich kopieren.

Patentansprüche.

1.) Verfahren zum Herstellen von Tonbildfilmen, ~~unter Verwendung kombinierter Ton- und Bildfilme, wobei die Ton-Bild-Positive auf einen gemeinsamen Film kopiert sind~~, dadurch gekennzeichnet, dass die Negative getrennt entwickelt werden.

2.) Verfahren zur Herstellung von kombinierten Tonbildfilmen gemäss Anspruch 1, dadurch gekennzeichnet, dass die Aufnahme der Tonzeichen und der Reihenbilder auf getrennten Filmen erfolgt.

2.) Verfahren ~~zur Herstellung von kombinierten Tonbildfilmen~~ gemäss Anspruch 1, dadurch gekennzeichnet, dass die Aufnahme der Tonzeichen und der Reihenbilder auf einen gemeinsamen Film erfolgt, der nachher getrennt wird.

3.) Verfahren ~~zur Herstellung von kombinierten Tonbildfilmen~~ gemäss Anspruch 1, ~~2~~, dadurch gekennzeichnet, dass die Negative nach erfolgter Behandlung der Länge nach miteinander vereinigt werden.

Reichspatentamt.

V. 16431. VI/57a^2.

Berlin SW. 61, den 27.Mai 1921

Herrn

Oberingenieur C.R. P o r t h,

Berlin-Tempelhof.

Albrechtstr. 104.

Nachstehend wird das Ergebnis der Prüfung mit der Aufforderung mitgeteilt, sich binnen 3 Monate äußern zu wollen.

Es ist an sich bekannt, die Tonschrift und die Bilder getrennt aufzunehmen und beide Reihen ~~dann~~ auch später- hin zu vereinigen, (vgl.Patentschr.279598,Kl.42g). Anspruch 2 erscheint daher nicht gewährbar. Die Bekanntmachung ist in Aussicht genommen, falls die Anmelder sich mit den zurückzureichenden Unterlagen einverstanden erklären.

Reichspatentamt.

Prüfungsstelle für Kl. 57a

gez.Unterschrift.

C.R. F o r t h,

Oberingenieur.

P.A. 327706. 15.6.21.

Bln.-Tempelhof, den 14.Juni 1921.
Albrechtstr. 104.

V.16431 VI/57 a^2

An das

Reichspatentamt

Berlin SW. 61

In Erledigung der Verfügung vom 27.5.1921 erkläre ich mich mit den amtlicherseits in den Unterlagen vorgenommenen Änderungen einverstanden und reiche in der Anlage die Urschrift zurück.

1 Urschrift.

gez. Unterschrift.

Reichspatentamt. Zu P.A. Nr. 327706. A.A. VI.

Berlin, den 27. 5. 1921.

V. 16431 VI/57 a^2.

B e s c h l u s s.

Die am 14. April 1921 eingegangene Patentanmeldung der Herren Ingenieur Hans Vogt in Berlin-Wilmersdorf, Babelsbergerstr. 49, Ingenieur Joseph Massolle in Berlin-Grunewald, Cunostr. 60 u. Physiker Dr. Joseph Engl, Berlin Grunewald, Hohenzollerndamm 53 ist bekanntzumachen.

Die Bekanntmachung erfolgt in der Klasse 57a, Gruppe 37 mit der Bezeichnung:

"Verfahren zum Herstellen von Filmen mit Bildreihen u. photographierter Tonschrift"

und zwar nach Ablauf der beantragten, mit dem Tage der Zustellung dieses Beschlusses beginnenden Aussetzungsfrist von 3 Monaten.

Zur Auslegung gelangen:

Beschreibung und 3 Patentansprüche, zuletzt eingegangen am 15.~~11~~.6.21, (P.A. 327706).

Reichspatentamt.

Prüfungsstelle für Klasse 57a^2.

Reichspatentamt. Zu P.A. Nr. 449500. A.A. VI.

Berlin, den 21.November 1922.

V. 16 431 VI/57 a 2

~~End~~Beschluss.

Auf die Anmeldung der Herren Hans Vogt, Berlin-Wilmersdorf, Babelsbergerstr. 42, Joseph Massolle, Bln.-Grunewald, Cunostr. 60 u.Dr. Joseph Engl, Bln.-Grunewald, Hohenzollerndamm 53, wird ein vom 15. 4.1921 an laufendes Patent unter der Bezeichnung:

"Verfahren zum Herstellen von Filmen mit Bildreihen & photographierter Tonschrift",

auf Grund der ausgelegten Unterlagen erteilt

Das Patent führt die Nummer 368383.

Reichspatentamt.

Prüfungsstelle für Klasse 57a2.

gez. Unterschrift.

AMERICAN CONSULAR SERVICE

German Reich,)
Province of Brandenburg,)
Consulate General of the) ss.
United States of America)
at Berlin.)

I, John F.Stone Vice Consul of the United States of America at Berlin, German Reich, duly commissioned and qualified, do hereby certify that Dr. Bertin

whose true signature and official seal are, respectively, subscribed and affixed to the foregoing instrument, was at the time of subscribing same an official of the Government... Patent office of the - - -

Certificate

The papers attached hereto are a correct and exact transcript of the basic documents of Patent 368,383. The patent has been assigned to the "Tri-Ergon Akt.-Ges." of Zurich (Switzerland).

Berlin, October 26, 1932

The President of the National Patent Office.

By Authority

(Signed) Dr. Harting.

Patent 368,383.

Patent Office 204110. April 14, 1922

C. R. F o r t h ,
Chief Engineer.

Tempelhof, April 13, 1921.
Albrechstrasse 104.

Patent Application.

To the

Patent Office,

Berlin. S.W.61.

The Undersigned herewith files an invention of Engineer Hans Vogt, Wilmersdorf, Babelsbergerstr. 49, Physicist Dr. Joseph Engl, Grunewald, Orberstr. 17, and Engineer Joseph Massolle, Grunewald, Cunostr. 60 relating to

"Method for the Manufacture of Combined Sound Picture Films"

and requests the grant of a patent.

The application fee of Rm. 80.- is being paid at the same time to the cashier of the Patent Office.

With this invention there are filed:

1 Description and Patent Claims,
1 Copy of the description and patent claims,
1 Receipt (self-addressed postcard),
1 Power of Attorney from the applicant to myself.

It is requested that after a decision to lay out the application, publication thereof be suspended for three months.

signed; Signature.

4 Enclosures.

C. P. F o r t h,

Chief Engineer.

~~Pr. Nr. 324119. 4. Pil. 16.~~

Tempelhof, April 13, 1921.
Albrechtstrasse 104.

Patent Application.

Patent Office. 327706
June 15, 1921.

Method for the Manufacture of a combined Picture Sound Film.

In the manufacture of a sound film (T in which the sounds are photographically recorded) it is particularly of great advantage for reasons of operation that the sound ~~sequence~~ record and the picture sequence be fixed upon a common carrier (film). ~~In this method~~ As a result of the various light conditions in the cinematographic recording there are effected numerous differences in the intensity of illumination of the silver bromide coating, in such a manner that the picture sequences are either over or under exposed. In that the same film however carries the normally illuminated sound sequences near the picture sequences in combined negatives this difference cannot be compensated for by development, weakening, amplification etc. They can only then be removed in that the over or under exposed negative parts of the film receive a separate appropriate treatment. ———————————— Technically this is as much as impossible so long as the two sequences are upon the same film.

According to this invention this difficulty is eliminated in that ~~for the manufacture of the negatives either wholly separate films are provided or such, which the recording are still connected to each other but which, prior to the development, are severed from each other.~~ the negatives are separately developed. Recording may be on either two films or upon a single film which is severed before development. The synchronism is maintained in both cases by the perforations and by corresponding marks.

The manufacture of the positive film can result in that the two negative films are preferably copied one after the other upon the same negative films. However, both the negative films can be reunited longitudinally by pasting them to each other and the combined negative can thus be copied as usual.

Claims:

1.) Method for the manufacture of ~~combined sound picture films in which the sound picture positive is copied on a common film,~~ positive films containing picture sequences and photographically recorded sound records characterized in this that the negatives are separately developed.

~~2.) Method for the manufacture of combined sound~~ picture films according to Claim 1, ~~characterized~~ in this that the recording of a sound sequence and the picture ~~sequence is accomplished upon separate film.~~

~~3.)~~ Method ~~for the manufacture of combined sound picture films~~ according to Claim 1, characterized in this that the recording of the sound record and the picture sequences take place upon one film which is afterwards severed.

~~4.)~~ Method ~~for the manufacture of combined sound picture films~~ according to Claims 1 and 3, characterized in this that the negatives are longitudinally united with each other after treatment.

Patent Office

L. 16431. VI/57a.2.

Berlin SW 61, May 27, 1921.

Chief Engineer C. R. F o r t h,

Berlin-Tempelhof

Albrechtstrasse 104.

Herewith the result of the examination is communicated to you with the request that you take a position thereon within three months.

It is known per se to record the sound and picture sequences separately and later on to combine both (Compare Patent Specification 279 598, Class 42 g). Claim 2 therefore does not appear allowable. Publication is contemplated in the event that the applicant declares his acceptance of the documents which are to be returned.

Patent Office

Examiner for Class 57a.

signed: Signature.

C. R. F o r t n ,

Chief Engineer.

Patent Office 327706. June 15, 1921.

Berlin-Tempelhof, June 14, 14, 1921.
Albrechstrasse 104.

V. 1642/1 VI/57a[2]

The Patent Office,

B e r l i n SW 61.

In reply to the action of May 27, 1921 I declare my acceptance of the changes which the Office has made in the documents filed and am herewith returning these documents.

Signed: Signature.

1 Enclosure.

PATENT OFFICE.

Responsive to Patent Office Document
Application Department VI.

Berlin, July 27, 1921.

V. 16431 VI/57a^2.

Decision.

The application filed on April 14, 1921 by Engineer Hans Vogt of Berlin-Wilmersdorf, Babelsbergerstr. 49, Engineer Joseph Massolle of Berlin, Grunewald, Cunostr. 60 and Physicist Dr. Joseph Engl, Berlin-Grunewald, Hohenzollerndamm 53 ist to be published.

The publication is to be made in Class 57a, Group 37 with the title:

"Method for the Manufacture of Films with Picture Sequences and Photographic Sound Record".

after the expiration of the requested extension of three months starting with the day of service of this decision.

There will be published:

Decision and three claims, which were last filed on June 6, 1921. (Patent Office Document 327 706).

Government Patent Office
Examiner for Class 57 a^2.

Government Patent Office. Responsive to Patent Office 449500. Application Division VI.

Berlin, November 21, 1922.

V. 16431 VI/57a[2]

Final Decision.

On the basis of published documents there will be granted on the application of Hans Vogt, Berlin-Wilmersdorf, Babelsbergerstr. 42, Joseph Massolle, Berlin-Grunewald, Cunostrasse 60 and Dr. Joseph Engl, Berlin-Grunewald, Hohenzollerndamm 53 a patent as of April 15, 1921, with the title:

"Method for the Manufacture of Films with Picture Sequences and Photographic Sound Record".

The patent will have Number 368 385.

Patent Office.

Examiner for Class 57a[2].

signed: Signature.

PJW/KB.

Defendant's Exhibit N. 2941

GREAT BRITAIN AND IRELAND.
LONDON, ENGLAND.
CONSULATE-GENERAL OF THE
UNITED STATES OF AMERICA. } ss.:

I JOHN H. FUQUA, Vice-Consul of the United States of America, at London, England, do hereby make known and certify to all whom it may concern, that the signature "A. J. MARTIN" subscribed to the annexed Certificate, is of the true and proper handwriting of A. J. Martin, Assistant Comptroller of the Patent Office, London, 2942
England, that the seal affixed to the said Certificate is the seal of the Patent Office, London, England; and that to all acts signed as the annexed full faith and credit are and ought to be given in Judicature and thereout.

In testimony whereof I have hereunto set my hand and affixed the Seal of the Consulate-General of the United States of America, at London, England, aforesaid, this 28th day of October, 1932. 2943

(Signed) J. H. FUQUA,
J. H. FUQUA,
Vice-Consul of the United States
of America,
at London, England.

(Seal)

Service No. 10449.

Fee $2.00—12/8d.
GN.
($2.00 Fee Stamp)

2944 *Defendant's Exhibit N.*

Form P. Cert. 1a.

PATENTS AND DESIGNS ACTS, 1907 TO 1928.

I, the undersigned, being an officer authorized by the Board of Trade under Section 62 (3) of the Patents and Designs Acts, 1907 to 1928, hereby certify that in connection with the application for Patent of Hans Vogt and others, No. 178,442, the annexed documents marked "1" to "4" are true copies respectively of the application
2945 form, the complete specification as placed open to public inspection on the 15th April, 1932, under the provisions of Section 91 of the Patents and Designs Acts, 1907 and 1919, the specification with translation of German Patent No. V.16431 VI/57 a 2, filed in support of the claim to priority of date under the provisions of the said Section, and of the complete specification as accepted and placed open to public inspection on the 16th November, 1922.

I also certify that the complete specification, in its accepted form, was first printed and placed
2946 on sale in the Sale Branch of this Office on the 7th December, 1922.

I further certify that a Patent was sealed in respect of the said application on the 1st February, 1923, and dated the 14th April, 1921, under the provisions of the said Section; that under date the 17th January, 1925, Tri-Ergon A.—G., of 6, Pelikantrasse, Zurich, Switzerland, a Swiss Company, was registered as proprietor of the said Patent by virtue of a Deed of Assignment dated the 16th August, 1924; and that the annexed document marked "5" is a true copy of an attested copy of the said Deed of Assignment.

Defendant's Exhibit N. 2947

This certificate is issued for use in the United States of America.

Witness my hand this
27th day of October 1932.

A. J. MARTIN.

The Patent Office,
25, Southhampton Buildings,
London, W.C.2,
England.

(Seal)

2948

178442

Patents Form No. 1b.
Stamp £1.

10394
11 Apr 1922

PATENTS AND DESIGNS ACTS, 1907 and 1919.

APPLICATION FOR PATENT UNDER INTERNATIONAL AND COLONIAL ARRANGEMENTS

2949 We, HANS VOGT, Engineer, of 49 Babelsberger Strasse, Berlin-Wilmersdorf; JOSEPH MASSOLLE, Engineer, of 60, Cuno Strasse, Berlin-Grunewald; and JOSEF ENGL, Doctor of Physics, 53 Hohenzollern-damm, Berlin-Grunewald; all in Germany, of German Nationality, do hereby declare that we have made application for protection of our invention of Process for producing combined sound-picture films, in the following Foreign State and on the following official date, viz.: Germany, 14th April, 1921.

That the said invention was not in use within the United Kingdom of Great Britain and Ire-

2950 *Defendant's Exhibit N.*

land and the Isle of Man by any other person or persons before the 14th April, 1921, to the best of our knowledge, information, and belief; and we humbly pray that a patent may be granted to us for the said invention in priority to other applicants, and that such patent shall have the date 14th April, 1921.

HANS VOGT.
JOSEPH MASSOLLE.
DR. JOSEF ENGL.

2951

We hereby appoint Messrs. Sefton-Jones, O'dell & Stephens, of 285, High Holborn, London, W.C.1, to act as our Agents in respect of the within application for a Patent, and request that all notices, requisitions, and communications relating thereto may be sent to such Agents at the above address.

Dated the 22nd day of February, 1922.

HANS VOGT.
JOSEPH MASSOLLE.
2952 DR. JOSEF ENGL.

10394
11 Apr 1922

This specification is a copy of the original specification at the date on which the application became open to public inspection.

PATENTS AND DESIGNS ACTS, 1907 & 1919.
PATENTS FORM NO. 3.
COMPLETE SPECIFICATION.

"Process for producing combined sound—picture films."

We, HANS VOGT, Engineer, of 49, Babelsberger Strasse, Berlin-Wilmersdorf; JOSEPH MASSOLLE,

Defendant's Exhibit N.

Engineer, of 60, Cuno Strasse,Berlin-Grunewald; and Josef Engl, Doctor of Physics, of 53, Hohenzollern-damm, Berlin-Grunewald; all in Germany, of German Nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

In the production of speaking films it is of great advantage especially from the point of view of use, to arrange the sound sequence and the picture sequence upon one and the same material carrier (film).

In this procedure, however, there frequently occur in consequence of the changing lighting conditions in the cinematographing process, changes in the degree of lighting of and the bromide of silver layer, and this causes the picture sequence to be either overlighted or underlighted.

As the same film, however, bears close to the picture sequence the continuously normally lighted sound sequence, those differences cannot be removed in the case of combined negatives by developing, weakening, strengthening and so forth. They can only be removed by subjecting the underlighted or the overlighted negative places to separate corresponding treatment.

Technically, this treatment is practically impossible so long as the two sequences are photographed upon the same film.

According to the present invention the difficulty is overcome by either employing entirely separate films for the production of the negatives or films which are connected during the photo-

2956 *Defendant's Exhibit N.*

graphing, but which are separated from one another before the developing.

The synchronism is assured in both cases by the perforations and by corresponding marks. The production of the positive films can take place by copying the two negative films preferably consecutively upon the same positive film.

One can however, also unite previously the two negative films longitudinally together, and then copy this so united negative in the usual manner.

2957

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Process for the production of a combined sound and picture films, in which the sound sequence and picture sequence positive are copied upon a single film, characterized by the feature that the respective negatives have been developed separately.

2958

2. Process for the production of combined sound and picture films according to claim 1, characterized by the feature that the photographing of the sound sequence and of the picture sequence takes place on separate films.

3. Process for the production of combined sound and picture films as set forth in claim 1 characterized by the feature that the photographing of the sound sequence and of the picture sequence takes place upon a single film which is subsequently divided.

4. Process for the production of combined sound and picture films as set forth in claims 1

Defendant's Exhibit N. 2959

to 3, characterized by the feature that the negatives after development are re-united.

Dated this 11th day of April, 1922.

SEFTON-JONES O'DELL & STEPHENS,
Chartered Patent Agents,
285, High Holborn,
London, W.C.1,
Agents for the Applicants.

[INTERNATIONAL CONVENTION] 2960

178442

BESCHEINIGUNG

10394

11 Apr 1922

Die Herren Hans Vogt in Berlin-Wilmersdorf, Joseph Massolle in Berlin-Grunewald, and Dr. Joseph Engl in Berlin-Grunewald haben im Deutschen Reiche ein Gesuch um ein Erfindungspatent für ein

"Verfahren zur Herstellung kombinierter Tonbildfilme" 2961

am 14. April 1921 beim Reichspatentamt hinterlegt.

Das angeheftete Stück stimmt mit der ursprünglichen Unterlage dieser Patentanmeldung überein.

Berlin, den 3. Mär 1922.

REICHSPATENTAMT.

(Seal of the Patent Office)

2962 *Defendant's Exhibit N.*

Verfahren zur Herstellung kombinierter Tonbildfilme.

V. 16431 VI/57 a.2.

Bei der Herstellung sprechender Filme ist es insbesondere aus Betriebsgründen von grossem Vorteil, die Tonreihe und die Bildreihe auf einen gemeinsamen materiallen Träger (Film) aufzubringen. Bei diesem Verfahren ergeben sich aber infolge der by der kinematographischen
2963 Aufnahme schwankenden Lichtverhältnisse häufig Unterschiede im Belichtungsgrad der Bromsilberschicht und zwar in der Weise, dass die Bildreihe über- bezw. unterbelichtet wird. Da der gleiche Film aber auch nahe an der Bildreihe die immer normal belichtete Tonzeichenreihe trägt, lassen sich bei kombinierten Negativen dise Unterschiede durch E n t w i e k l u n g, Abschwächen, Verstärken etc. nicht ausgleichen. Sie lassen sich nur dadurch beheben, dass die unter- bezw. überbelichteten Negativstellen eine getrennte, entsprechend abgepasste Behandlung
2964 erhalten.

Technisch ist dies so gut wie unmöglich, solange sich die beiden Ereignisreihen auf dem gleichen Film befinden.

Erfindungsmäse wird diese Schwierigkeit dadurch beseitigt, dass zur Herstellung der Negative entweder gänzlich getrennte Filme vorgesehen sind oder solche, die bei der Aufnahme wohl noch zusammenhängen, vor der Entwicklung aber auseinander getrennt werden. Der Synchronismus wird in beiden Fällen durch die Perforation und durch entsprechende Marken gewährleistet.

Defendant's Exhibit N.

Die Herstellung der Positivfilme kann erfolgen, indem man die beiden Negativfilme, vorteilhaft nacheinander, auf den gleichen Positivfilm kopiert. Man kann aber auch die beiden Negativfilme vorher der Länge nach fiteinander verkleben und dieses so gewonnene kombinierte Negativ wie üblich kopieren.

Patentansprüche.

1.) Verfahren zur Herstellung kombinierter Tonbildfilme. wobei die Ton- Bild- Positive auf einen gemeinsamen Film kopiert sind, dadurch gekennzeichnet, dass die Negative getrennt entwickelt werden.

2.) Verfahren zur Herstellung von kombinierten Tonbildfilmen, gemäss Anspruch 1, dadurch gekennzeichnet, dass die Aufnahme der Tonzeichen und der Reihenbilder auf getrennten Filmen erfolgt.

3.) Verfahren zur Herstellung von kombinierten Tonbildfilmen, gemäss Anspruch 1, dadurch gekennzeichnet, dass die Aufnahme der Tonzeichen und der Reihenbilder auf einem gemeinsamen Film erfolgt, der nachher getrennt wird.

4.) Verfahren zur Herstellung von kombinierten Tonbildfilmen gemäss Anspruch 1-3, dadurch gekennzeichnet, dass die Negative nach erfolgter Behandlung der Länge nach miteinander vereinigt werden.

2968 *Defendant's Exhibit N.*

PATENTS AND DESIGNS ACTS, 1907 & 1919.

STATUTORY DECLARATION.

IN THE MATTER of an Application for Letters Patent in the United Kingdom under the International Convention by HANS VOGT, JOSEPH MASSOLLE and DR. JOSEPH ENGL.

10394
11 Apr 1922

2969 I, HERBERT SEFTON-JONES, of the firm of Sefton-Jones, O'Dell and Stephens, 285, High Holborn, London, W.C.1, Patent Agent, solemnly and sincerely declare as follows:

That the following is an exact translation made by me of the Certificate of the German Patent Office and the certified copy of the German Patent Specification attached thereto filed at the German Patent Office with the Application of HANS VOGT, JOSEPH MASSOLLE and DR. JOSEPH ENGL, on the 14th April, 1921, which Certificate
2970 and certified copy are filed herewith.

CERTIFICATE.

Messrs. Hans Vogt of Berlin-Wilmersdorf, Joseph Massolle of Berlin-Grunewald, and Dr. Joseph Engl of Berlin-Grunewald, have filed in Germany an Application for a Patent of Invention for a

"Process for the production of combined tone and picture films"

on the 14th April, 1921, at the Patent Office.

Defendant's Exhibit N. 2971

The attached document corresponds with the original documents of this Patent Application.

BERLIN, the 3rd March, 1922.

THE PATENT OFFICE.
(Seal)

V. 16431 VI/57 a 2.

2972

"Process for the production of combined tone and picture films."

V. 16431 VI/57 a. 2.

In the production of speaking films it is of great advantage, especially for operative reasons, to combine the series of tone marks and the series of pictures upon a common material carrier (film).

In this procedure, however, there occur frequent differences in the degree of lighting of the Bromide of silver layer in consequence of the varying lighting conditions during the cinematographic exposure, and this, moreover, in the manner that the picture series is either over-lighted or under-lighted. As the like film, however, also bears close to the series of pictures the continuously normal lighted roll of tone marks, these differences cannot be equalized in combined negatives by developing, weakening, or strengthening, &c. They can there only be remedied by giving to the under-or over-lighted

2973

2974 *Defendant's Exhibit N.*

parts of the negative a separate correspondingly adapted treatment.

Technically this is almost impossible as long as the two series of impressions are placed on the same film.

According to the present invention, this difficulty is obviated by the procedure that for the production of the negative either entirely separate films are provided, or films which are connected together for the photographing but which
2975 are separated from one another before the developing. The synchronism is guaranteed in both cases by the perforation and by corresponding marks.

The production of the positive film can take place by copying the two negative films, preferably one after the other, on the same positive film. One can, however, also stick together the two negative films previously lengthways and copy in the usual maner the combined negatives thus produced.

2976

PATENT CLAIMS.

1. Process for the production of combined sound and picture films whereby the sound and picture positives are copied upon a common film, characterized by the feature that the negatives are developed separately.

2. Process for the production of combined sound and picture films according to Claim 1, characterized by the feature that the taking of the sound marks and the series of pictures takes place on separate films.

Defendant's Exhibit N.

3. Process for the production of combined sound and picture films according to Claim 1, characterized by the feature that the taking of the sound marks and the picture series takes place upon a common film which is afterwards divided.

4. Process for the production of combined sound and picture films according to Claims 1 to 3, characterized by the feature that the negatives after treatment are united together longitudinally.

And I make this solemn declaration conscientiously believing the same to be true and by virtue of the Provisions of the Statutory Declarations Act, 1835.

HERBERT-SEFTON JONES.

Declared at 26 Lincoln's Inn Fields in the County of London,

this 11th day of
April, 1922.

Before me

R. FORD SMITH,
A Commissioner for Oaths.

2980

Defendant's Exhibit N.

[Second Edition.]
(SEAL)

PATENT SPECIFICATION

Convention Date (Germany): Apr. 14, 1921.
Application Date (in United Kingdom): Apr. 11, 1922.
Complete Accepted: Nov. 16, 1922.
No. 10,394/22. 178,442

COMPLETE SPECIFICATION

Process for Producing Combined Sound-picture Films.

We, HANS VOGT, Engineer, of 49, Babelsberger Strasse, Berlin-Wilmersdorf, JOSEPH MASSOLLE, Engineer, of 60, Cuno Strasse, Berlin-Grunewald, and JOSEF ENGL, Doctor of Physics, of 53, Hohenzollern-damm, Berlin-Grunewald, all in Germany, of German nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

2981

In the production of speaking films, it is of great practical advantage to take the sound record and the picture record on one and the same film.

In this operation, however, changes in the degree of lighting of the layer of bromide of silver frequently occur owing to changing lighting conditions in the cinematographic process, and this causes over-exposure or under-exposure of the picture sequence.

If the continuously normally lighted sound record is borne adjacent to the picture record on the same film, the effect of the variations of exposure cannot be removed by developing, by weakening or strengthening the solution, and so forth. They can only be removed by subjecting the under-exposed or over-exposed negative places to separate appropriate treatment, but this is practically impossible as long as the two sequences are treated alike, being photographed on the same film.

2982

The process for the producion of combined sound-picture films hereinafter set forth differs from previous attempts in this direction, chiefly in the perfect synchronization of the sound and picture-sequences, whilst permitting of the separate development of the respective negatives necessitated by unavoidable variations in the lighting of the films during the initial exposure.

Attempts have been made to attain the end in view by taking the two negatives separately and independently and subsequently combining the records for reproduction; but it is found impossible to secure full synchronization in this manner.

It has also been proposed to pass two separate films for the picture and sound records respectively, the films being driven positively and simultaneously by passing over the same sprocket wheel through a talking apparatus and to provide means for producing a series of corresponding identification marks upon the films by aid of which the two films after separate development can be reassembled; but this process also lacks the requisite accuracy of register.

According to the present invention, the difficulty is overcome by employing films for the production of the negatives which are integral during the photographing, but which are separated from one another before developing.

After development, these two negative films are re-united and are copied upon the same positive film. In this way, the absolute coincidence of the sound and the picture record respectively is assured, whilst the needful difference in treatment can be given during the development.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

Improved process for the production of combined sound and picture records, in which the sound record and the picture record are produced simultaneously on a single film which is then divided and the two parts developed separately, and afterwards re-united and used to print the single positive record.

Dated this 11th day of April, 1922.

SEFTON-JONES, O'DELL & STEPHENS

Abingdon: Printed for His Majesty's Stationery Office, by Burgess & Son.

[*Price 1/—*] [Wt. 56A.—125/1/1929.]

Defendant's Exhibit N. 2983

I hereby certify that this is a true and exact copy of the original Indenture dated the 16th day of August 1924.

Dated the 22nd day of September 1924.

ARTHUR STEPHENS

(Stamp—One Shilling)

Stamp Six Pence.

Stamp Six Pence. 2984

THIS INDENTURE made the 16th day of August One thousand nine hundred and twenty-four BETWEEN JOSEF ENGL, of 53, Hohensellerndamm, Berlin-Grunewald, Germany, doctor of physics, HANS VOGT, of 49, Babelsbergerstrasse, Berlin-Wilmersdorf, Germany, Engineer and JOSEPH MASSOLLE, of 60, Cunostrasse, Berlin-Grunewald, Germany, Engineer, all citizens of the German Republic, hereinafter called the assignors, (which expression shall include executors, adminstrators and assigns, where the context so requires or admits), of the one part, and the firm TRI-ERGON A.-G. of Pelikanstrasse 6, Zurich, Switzerland, hereinafter called the assignees (which expression shall include executors, successors and assigns, where the context so requires or admits), of the other part. 2985

WHEREAS by letters patents

Nos. 177,530 dated 24th March 1921
177,514 dated 24th March 1921
178,133 dated 9th April 1921
178,442 dated 14th April 1921
189,982 dated 23rd November 1921

2986 *Defendant's Exhibit N.*

His Majesty King George V did give and grant subject to the provisos therein mentioned unto the said assignors His special license, full power, sole privilege and authority, that the assignors by their agents or licensees and no other may at all times thereafter during the term of sixteen years from the date of said Letters Patents, make, use, exercise and vend within the United Kingdom, of Great Britain and Ireland, and Isle of Man, in such manner as to them may seem
2987 meet, their inventions.

Now this Indenture Witnesseth that in consideration of Five Pounds Sterling (£5) now paid by the assignees to the assignors, the receipt of which is hereby acknowledged, the assignors do hereby assign and convey unto the assignees the said inventions hereinbefore mentioned and the hereinbefore recited Letters Patents, and the full and exclusive benefits and advantages thereof respectively and of any extension and benefits and advantages whatsoever to
2988 the same inventions. Letters Patents and premises belonging to hold the same unto the assignees during all the residues now unexpired of the said term by the said Letters Patents granted and during any extension of the said terms.

In pursuance of Section 73 of the Finance Act, 1910, it is hereby certified that the transaction above effected does not form part of a larger transaction or of a series of transactions in respect of which the amount or value or the aggregate amount or value of the consideration exceeds £500.

Defendant's Exhibit N. 2989

IN WITNESS WHEREOF the said parties to these presents have hereunto set their hands and seals the day and year first above written.

SIGNED SEALED AND DELIVERED BY THE SAID HANS VOGT OF the first part in the presence of: — HANS VOGT

DR. HANS GRONTHER

FRITZ SCHMIDTHEIN

2990

SIGNED SEALED AND DELIVERED by the said JOSEF ENGL of the first part in the presence of: — JOSEF ENGL

DR. HANS GRONTHER

FRITZ SCHMIDTHEIN

SIGNED SEALED AND DELIVERED by the said JOSEPH MASSOLLE of the first part in the presence of: — JOSEPH MASSOLLE

2991

DR. HANS GRONTHER

FRITZ SCHMIDTHEIN

SIGNED SEALED AND DELIVERED by the said firm of TRI-ERGON A.-G. of the second part in the presence of: — TRI-ERGON A.-G

J. HEUSSER-STAUB H. HEBERLEIN

DR. R. SUTER

J. STAHLI-REBMANN

2992 *Defendant's Exhibit N.*

Die ruckseitigen Unterschriften

1) des Ingenieurs Hans Vogt in Berlin Wilmersdorf Babelsbergerstr 49,

Stamp
1/-

2) des physikers Dr. Josef Engel in Berlin Grunewald Hohenzollerndamm 53

2993 3) des Ingenieurs Joseph Massolle in Berlin-Grunewald Cunostr. 60

beglaubige ich

No. 221 Not. Reg Jahr 1924
Berlin, den 16 August 1924
Sabersky
Notar

Stamp
1/-

Kostenbergehnung
Der Wert des Gegenstandes beträgt 500 G. m.

2994

1. Geuühren nach 5 der Gebuhrenordnung und 32.41 des Gerichtskostengesetzen vom 25.7.1910/29.4.20	2 gm.
2. Pauschsatz (20 d. Geb.—Ord f. Not)	3 gm.
3. Stempel	
4.	
Zusammen	5 gm.

Der Notar

SABERSKY

Stamp
1/-

Defendant's Exhibit N. 2995

Legalisation

Vue pour l'egalisation de la signature ci-dessus de la maison Tri-Ergon S. A. Tiefenhofe 7, Zurich 1, apposee par M. M. Jakob Heusser-Staub, Fabrikant, Zollikerstr. 225 a Zurich 8,

Zurich 8, le 30 Aout 1924
Geb. Frk. 2 Notariat Riesbach—Contr. No. 699 Zurich.

J. B. ACHMANN
Notar 2996

Legalisation

Vu pour l'egalisation de la signatur de M.M. Dr. R. Suter, Advokat, Gessnerstr. No. 24 a St. Gallen u. Jak. Stahli-Rebmann, Kfm., Feldegg-str. 58, Zurich 8.

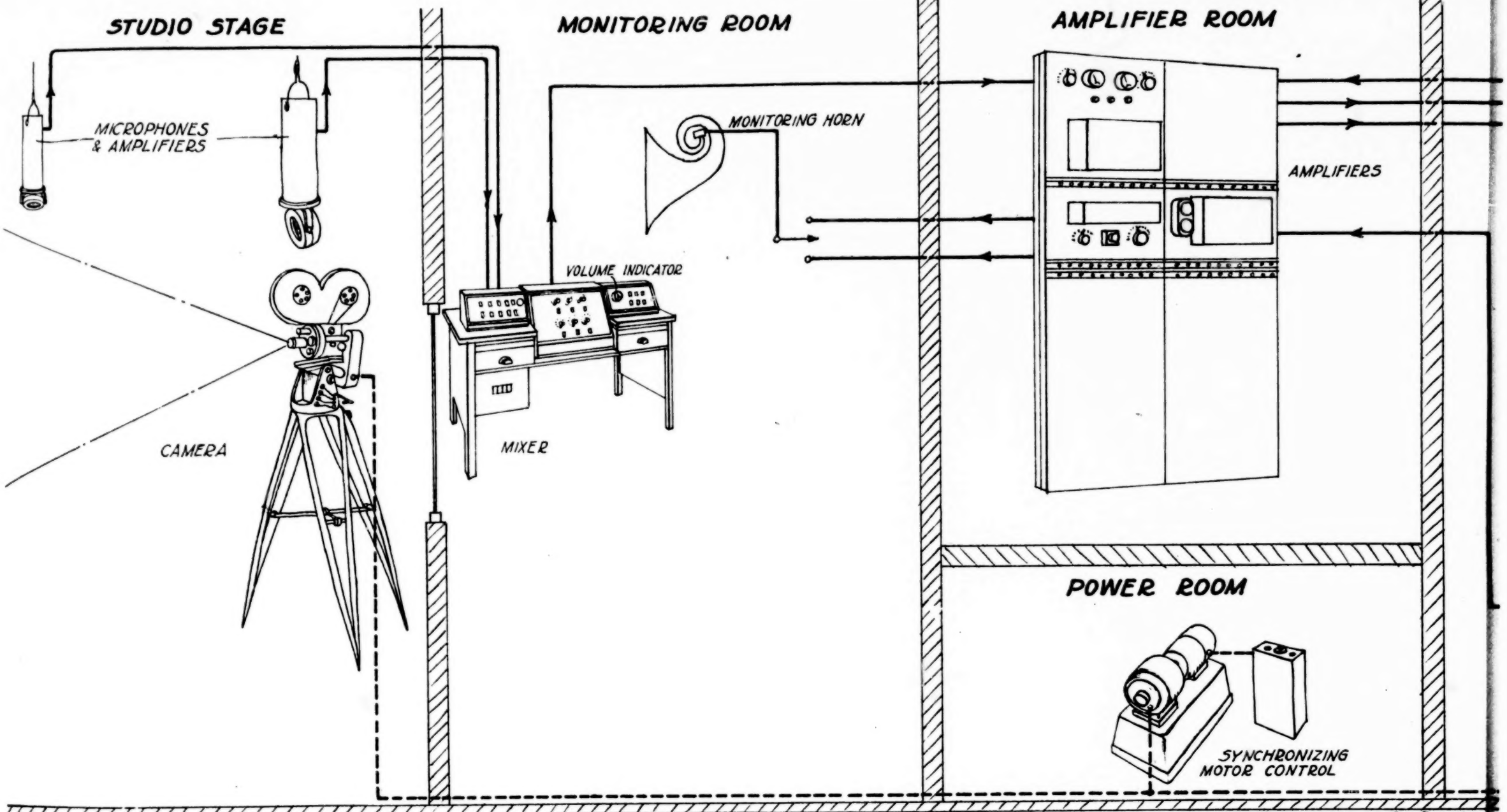
Zurich 8, le 30 Aout 1924
Geb. Frk. 4
Contr. No. 702/3

2997
Notariat Riesbach-Zurich

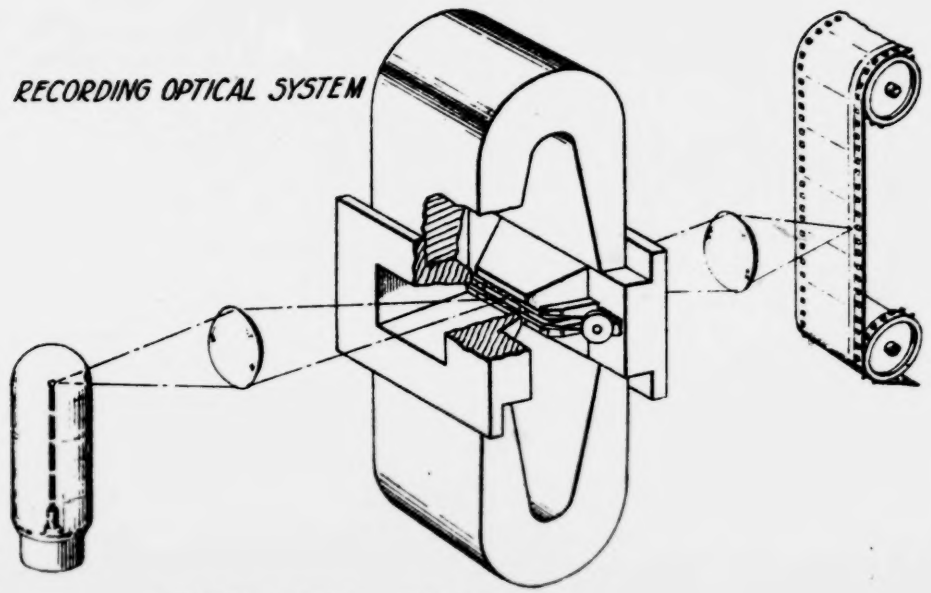
J. B. ACHMANN
Notar

Stamp
1/-

WESTERN ELECTRIC RECORDING SYSTEM



DEFENDANT'S EXHIBIT O



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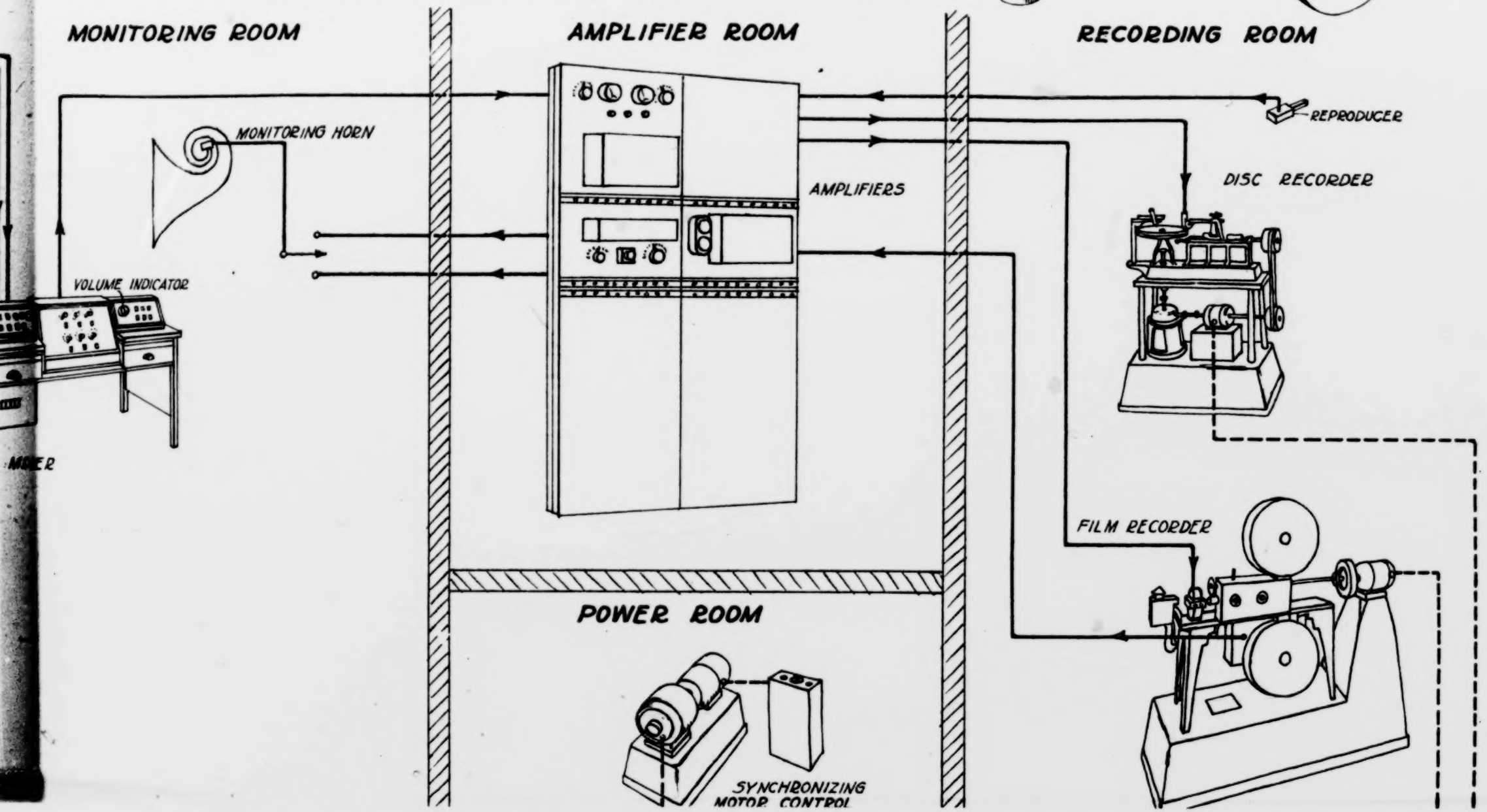

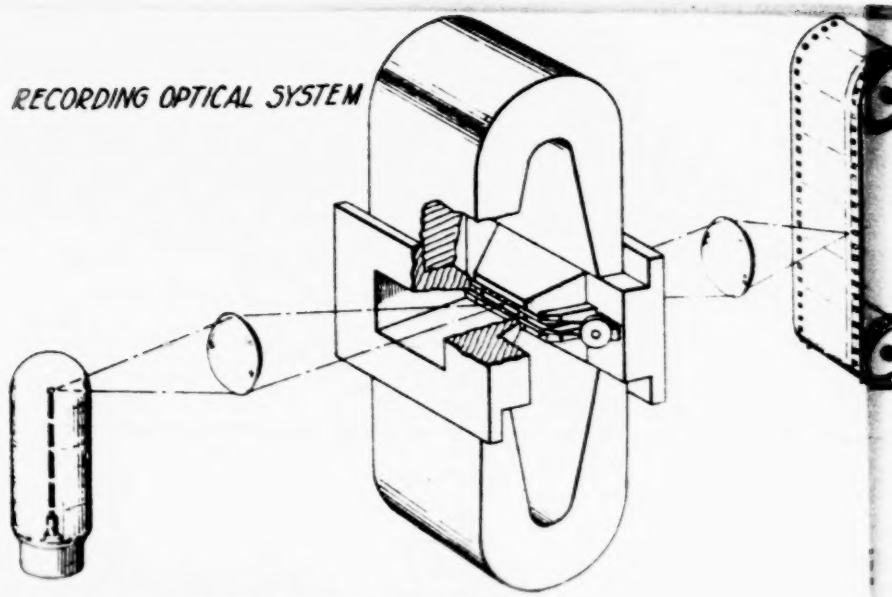

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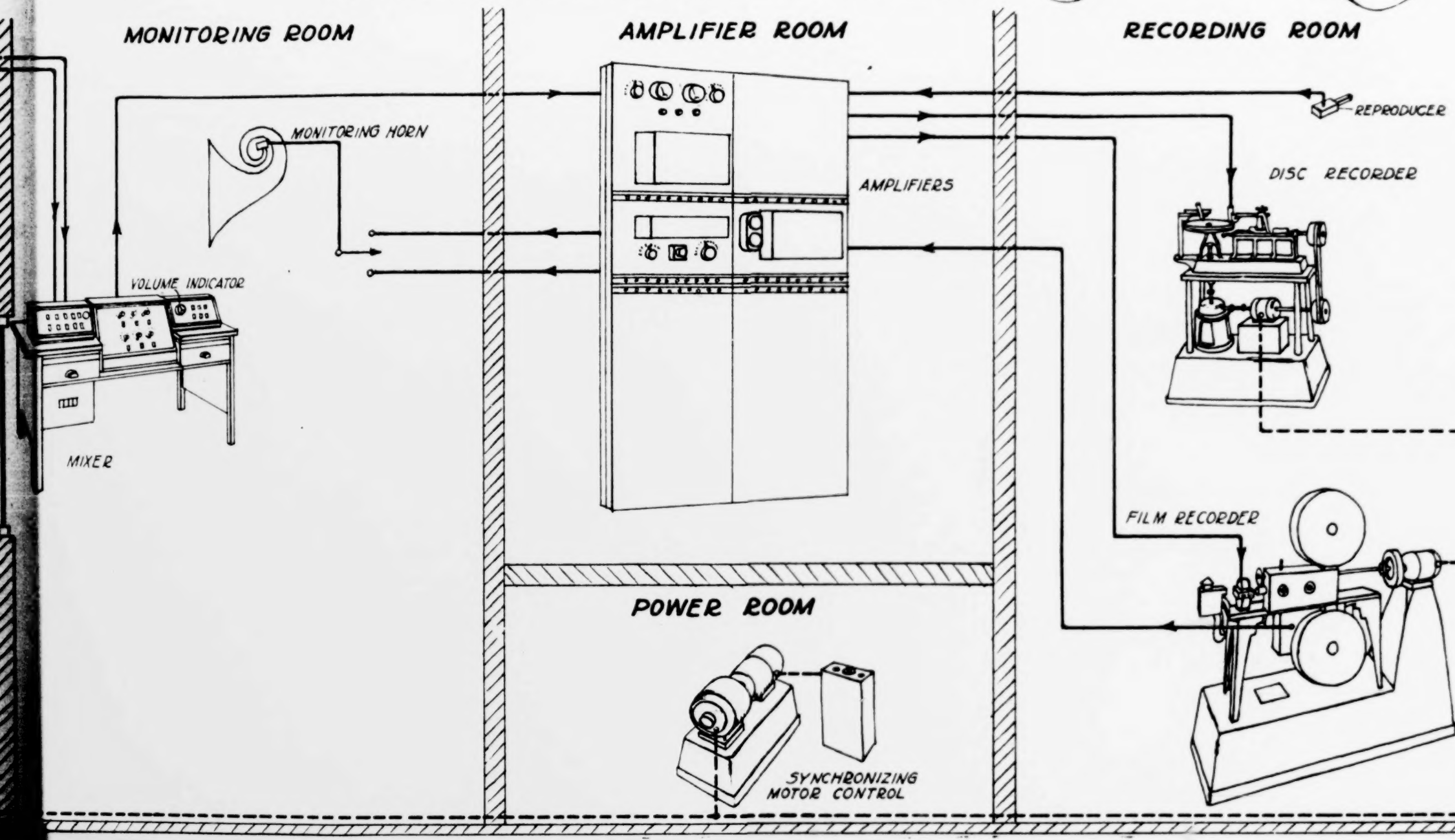
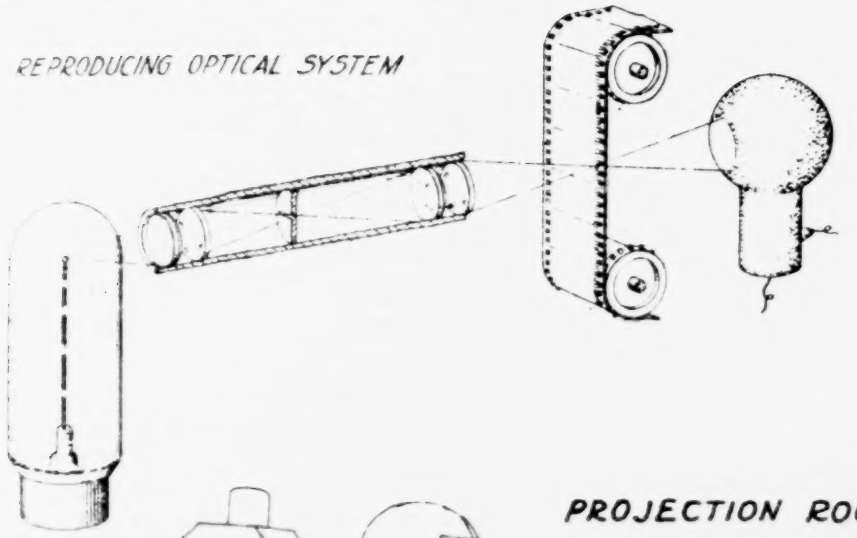
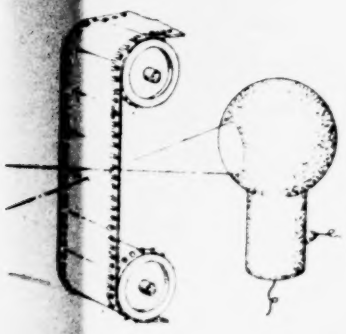


WESTERN ELECTRIC REPRODUCING SYSTEM



DEFENDANT'S EXHIBIT P



PROJECTION ROOM

WESTERN ELECTRIC REPRODUCING SYSTEM

STAGE

FILM

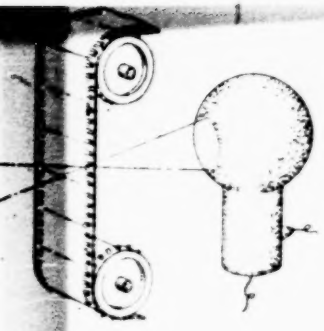
MONITORING HORN

AMPLIFIERS

FADER

HORN

SCREEN



WESTERN ELECTRIC REPRODUCING SYSTEM

PROJECTION ROOM

STAGE

FILM

MONITORING HORN

HORN

AMPLIFIERS

FADER

SCREEN

5081-1

DEFENDANT'S EXHIBIT Q

DIV. 7 — 1913 — (EX'R'S BOOK) 207-684

NUMBER (Series of 1900),

765,954 — PATENT No. 1260337

Name Richard M. Craig

of San Antonio,

County of

State of Texas.

Invention Phonographic Attachment for Moving Picture Machines

Division of App., No. ..... filed ....., 191

PARTS OF APPLICATION FILED	ORIGINAL	RENEWED
Petition	May 6 .191 3.	.191
Affidavit	" " .191 3	.191
Specification	" " .191 3.	.191
Drawing 2 sheets	1 " " .191 3	.191
Photo Copy	.191	.191
First Fee Cash $15	May 6 .191 3	.191
" " Cert	.191	.191
Appl. filed complete	May 6 .191 3	.191

Examined and Passed for Issue Aug. 17 .191 7 .191

J. H. Strickman Ex. Ex. Exr. Div.

Notice of Allowance Aug 23 .191 7 .191

Final Fee Cash $20 Feb 25 .191 8 .191

" " Cert .191 .191

Patented MAR 26 1918 .191

Attorney R. L. & B. B. Lacey, City

Associate Attorney

(No. of Claims Allowed 20.) Title as Allowed Phonographic Attachment for Moving Picture Machines

O.G. Cls. 1, 4, 7 and 20

765,959

MAY 6 1913

Petition.

To the Commissioner of Patents: 5086-". MBW.

Your petitioner (1) Richard M. Craig, citizen of the United States residing at San Antonio, in the County of Bexar, and State of Texas, P. O. Address 117 South Pinto Street, Station A, San Antonio, Texas, prays that Letters Patent may be granted to him for improvements in Phonographic Attachments for Moving Picture Machines, set forth in the annexed Specification.

And he hereby appoints the firm of **R. S. & A. B. Lacey**, of Washington, D. C., Robert S. Lacey, Anderson B. Lacey, Samuel N. Acker and Frederic B. Wright, constituting said firm (Registration No. 496), his attorneys with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to sign the drawings, to receive the Letters Patent, and to transact all business in the United States Patent Office connected therewith.

Signed at San Antonio, in the County of Bexar and State of Texas this 23 day of April 1913

Sign here. First name in Full. Richard M. Craig

(1) In case of assignment of the invention, application and oath must be made by actual inventor, even if patent issue to assignee.

SPECIFICATION.

To All Whom it May Concern:

BE IT KNOWN That I, Richard M. Craig, citizen of the United States residing at San Antonio, in the County of Bexar, and State of Texas, have invented certain new and useful improvements in Phonographic Attachments for Moving-Picture Machines, of which the following is a specification:

W-P March 24, 1913.

My invention relates to phonographic or "talking" moving pictures, and more particularly to the art of taking and projecting such moving pictures with the accompaniment of sound recording and sound reproduction respectively.

There are three essentials necessary for the complete success of moving pictures, namely, they must correctly simulate and reproduce natural motion which they do; they should reproduce the natural colors of the object, and they should reproduce sound as an accompaniment to the movement or the subject matter of the pictures.

Many attempts have been made to secure with the reproduction of moving pictures, the reproduction of sounds correlated therewith. Almost all these attempts have been made by operating the moving picture film in

conjunction with the ordinary phonograph or gramophone. The difficulty of using an instrument of this character to reproduce sounds correlated with the film is that the phonograph must of necessity be practically a separate machine from either the camera whereby the pictures are taken, or the projector whereby they are thrown upon the screen, and the with either the gramophone or the phonograph it is practically impossible to secure a sound record which shall be contermious with the moving picture film. The maximum sound record as used today will not run for longer than five minutes, whereas the moving picture scene may be very much longer. Further than this, it is practically impossible to run the phonograph or gramophone in synchronism with the film and this is a very vital necessity for the proper correlation of the sound record with the pictures. Again, if the film runs off or breaks, the phonograph must be stopped, and it is almost impossible to again adjust the film in proper correspondence and correlation with the sound record. The mere correcting up of the sound recording mechanism with the mechanism of the moving picture machine will not secure a complete correspondence and correlation between the sound and the pictures, for the reason that the film is liable to slip and to tighten or loosen upon the reels, and it would be extremely hard to adjust the sound record so as to correspond accurately with the motion of the picture. An accurate correspondence between sound with the event with which the sound is correlated, is, of course, absolutely necessary to prevent a disjunction which would entirely spoil the effect.

Furthermore, the phonographic record can naturally contain only so many words and this requires the film to

be made of a certain length only, this length corresponding with the phonographic record, instead of which the sound record should be made for and with the picture record of any possible scene or happening that might occur, and the sound record should have the same length as the scene record and not be limited as to length.

Again, the process of making phonographic records requires extra care and especially prepared staging. The phonograph is placed at or near the screen upon which the picture is to be projected and thus can not be run by the same mechanism which drives the moving picture film. The phonograph requires an extra attendant to place the records thereon. Furthermore, the picture record and the sound record have heretofore been taken separately and could not therefore be in accurate correspondence, nor could they ever be placed in accurate correspondence under those circumstances. It is a very difficult problem and requires an elaborate arrangement of costly mechanism to keep a film synchronized with a phonographic record. If the film happens to run off while exhibiting the phonographic record and the pictures on the film get out of time, it is practically impossible to get them in time again. If the film should happen to get torn in two or broken, which sometimes happens, and the film is cemented together, the words corresponding to the part torn out of the film can never be taken from the phonograph record, and this destroys the further use of the two together. In the case that a phonograph is used for the reproduction of sound, only one reproducing apparatus or one source of sound can be used which is the phonograph and which must be placed behind the screen. In the case of a theatre, it

leaves for

is obvious that it is of great advantage to be able to have the same sound issue from a number of sources located at various points around the theatre so that the sound may be heard [illegible]

The primary object of my invention is the provision of mechanism whereby a sound record may be made or reproduced synchronously with the taking or reproduction of moving pictures.

A further object is to so form the sound recording or reproducing mechanism that it may be used with ordinary moving picture taking or reproducing mechanism so that no change will be required in the mechanism now used for this purpose.

A further object is to provide means whereby the picture record and the sound record may be recorded simultaneously and by the same machine, under the control of the same operator and not individually and separately as they now are.

A further object is to provide means whereby the picture carrier, that is, the film, may also be the sound record carrier so that the pictures and the corresponding sounds shall be at all times in fixed relation to each other, taken simultaneously, reproduced simultaneously and with no possible chance of the sound record having its relation to the picture record in any way changed.

A further object is to so form the sound and picture carrier, in this case the film, that the sound may be reproduced without reproducing the picture, or the picture reproduced without reproducing the sound.

A further object is to so form the sound record that the sound vibrations may be translated into electrical

vibrations, and these in turn carried to various parts of the hall within which the machine is to be used.

A still further object is to so construct the machine both for taking and reproducing the pictures and accompanying sounds that the method of operation shall be extremely simple, both as regards the taking and making of sound records and the taking and making of picture records, and as to the simultaneous or synchronous taking or reproduction.

A further object is to provide mechanism whereby the sounds may be recorded upon the picture carrying film of moving picture machines and reproduced therefrom, this film being so formed that the picture record and the sound record may overlie each other without the sound record interfering with the picture record or vice versa.

A further object of the invention is to so form the film that the picture record may be taken in the ordinary manner and printed photographically upon one side or face of the film while the sound record may be taken photographically and printed upon the other face of the film.

A further object in this connection is to provide a film for carrying moving pictures and accompanying sound records, in which the sound record is formed by a substance which does not affect or impair the transmission of ordinary or white light but which will impair, affect or be more or less impervious to the passage of rays beyond the visible rays of the spectrum.

A further object is to form a sound record upon a film capable of transmitting light, this sound record being formed by material which is pervious to ordinary white

light but which is impervious to or effects the transmission of infra-red rays.

A further object is to so construct the mechanism for reproducing a sound record in conjunction with the projection of moving pictures that while the film shall move at one point intermittently to reproduce the pictures, the film shall move steadily at another point to reproduce the sound record, and in this connection to provide mechanism for causing the projection of white light through that portion of the film which is moving intermittently and causing the projection of invisible rays through that portion of the film which is moving steadily, and further in this connection to provide in combination with the means for projecting the invisible rays through said film, sound transmitting mechanism of such character as to be operated by the action of these invisible rays to thereby reproduce the sound record on the film.

My invention is illustrated in the accompanying drawings wherein:

Figure 1 is an elevation partly sectional of a moving picture machine so constructed as to reproduce a corresponding sound, the figure also showing the screen upon which the picture record is thrown and a loud-speaking phone disposed behind the screen.

Fig. 2 is a vertical section on the line 2-2 of Fig. 3 of a camera for taking moving pictures making correlated sound records.

Figure 3 is a front elevation of the camera shown in Figure 2.

Figure 4 is a diagrammatic plan view of a hall or auditorium showing the arrangement of phones for trans-

mitting the sounds reproduced by my mechanism.

Figure 5 is a fragmentary view of one side of a film showing moving pictures thereon.

Figure 6 is a face view of the opposite side of a film showing photographic sound records thereon.

Figure 7 is a view of a composite film showing the position of the sound records with relation to the pictures.

Figure 7a is a fragmentary section of the film shown in Figure 7.

Figure 8 is a face view of the sound record side of a film but illustrating a slightly different record on the film.

Figure 9 is a diagrammatic view of a telemeter as used by me for the purpose of reproducing sound vibrations.

Figure 10 is a diagrammatic view of another form of sound recording mechanism.

Sheet 7 (2)
A'

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

My invention is based upon the fact that infra-red rays are invisible but that these rays will affect a properly sensitized photographic film, and that these infra-red rays will affect various forms of electrical phonographic receivers or sound transmitting devices. Infra-red rays may be passed through an ordinary photographic film or the film of a moving picture ~~without being visible and~~ without interfering with the proper projection of the picture by moving picture projecting apparatus. If a ~~picture~~ film ~~strip~~ is prepared, therefore, having on one side the ordinary photographic reproductions of pictures, and on the other side a photographic sound record, capable of being reproduced only by ~~the~~ infra-red rays, the sound record will not interfere with the passage of white light to and through the pictures and the presence of the pictures will not interfere with the passage of infra-red rays through the strip. On one side of the film or the strip, therefore, would be the ordinary picture record and on the other side would be a printed photographic record of sound, which record would be transparent to ordinary visible light but ~~which~~ record would more or less intercept the infra-red rays to produce variations in the projection of these rays, these variations being used to affect sound transmitting apparatus as will be later stated. Infra-red rays are below the ordinary visible spectrum. They are invisible to the naked eye and are very penetrating and are subject to the same optical laws as ordinary light.

Many substances will cut off visible light entirely but will let the infra-red rays pass nearly perfectly. Vulcanite, iodine, bromine and many other substances will permit the passage of these infra-red rays. Many substances such as alum, cupric chloride, water, oxygen, carbonic acid gas, very thin metallic silver and selenite will, on the contrary, permit the passage of visible or white light but will cut off more or less the passage of the infra-red rays.

Ordinary celluloid, of which material the moving picture film is usually constructed, is very transparent, both to the visible light rays and to the infra-red rays. By coating one side of a strip of celluloid, therefore, with a substance impervious to the white light rays and the other side with a translucent substance impervious to the infra-red rays, neither of the coatings would interfere with the passage of these rays and both records, the picture record and the sound record, could be combined on one film.

For the visible light picture record, there are many photographic prints (such as most any of the present forms of positive prints) which would interfere not at all with the passage of the infra-red rays, and it is therefore only necessary to provide a proper transparent coating on the strip or film which will intercept more or less the infra-red rays and yet will not affect the passage of the rays of white light.

One of the substances which would permit ordinary light to pass but which is opaque or impervious to the infra-red rays is very thin metallic silver, but I do not wish to be limited to this as any material which would cut off,

intercept, destroy or reflect back the infra-red rays would be equally suitable. This would be done by any substance having a high percentage of water of crystallization or a high percentage of water of constitution, a high percentage of selective reflection, or a high percentage of selective absorption. This infra-red ray intercepting substance is to be combined with gelatine, as for instance, the gelatine of the film, this gelatine acting as or being a medium for carrying said substance and this medium being subject to the photographic action for obtaining the necessary sound record.

In Figs. 5, 6, 7 and 7^a I show a portion of a film or strip of moving pictures designed to be used in my invention, both for the purpose of taking the moving pictures and for the purpose of reproducing them. Fig. 7^a is an enlarged sectional view, as it may be termed, and in this figure, 2 designates the body of the film, 3 a coating upon which the photographic picture print is made or taken, and 4 a coating of a substance which is capable of being acted upon photographically by ordinary light, and which will act as a medium to carry a substance which will act to intercept either partially or entirely ~~said~~ infra-red rays to thereby cause the reproduction of sound by electrical transmission devices. Fig. 5 shows the face view of the film, as it may be termed, with moving pictures thereon. Fig. 6 shows the reverse side of the film and illustrates diagrammatically the sound record as photographed upon the film. Fig. 7 illustrates the compound record and shows that the sound record extends entirely across the film and therefore underlies the picture record.

While in Figs. 6 and 7 the sound record is shown

as being made up of lighter or heavier lines or ~~perpendicular~~ parallel striations extending entirely across the strip from one edge to the other, it is possible to have one record to extend from one marginal edge to the middle of the strip and another record to extend from the middle of the strip to the marginal edge. Such a record is shown in Fig. 8 wherein 4^a indicates one sound record and 4^b another sound record. The film shown in Fig. 8 is particularly adapted for use in a manner hereafter described.

It is, of course, necessary that the sound record and the picture record should be made simultaneously so that there will be complete synchronism between the sound record and the events shown by the pictures. In Figs. 2 and 3, 5 designates a double camera which will take moving pictures by means of the ordinary moving picture camera mechanism and which is provided with a compartment 6 containing the photographic camera proper having a compartment 7 which contains what may be termed the sound camera mechanism for making a negative sound record.

Inasmuch as the mechanism used for taking the moving pictures is of the ordinary form, it requires no special description. This mechanism is actuated by means of the shaft 8 having the usual crank 9. The compartment 7 wherein the sound photographing mechanism is disposed, is preferably divided into an upper and a lower reel compartment in which are located respectively the reels 10 and 11. The film or strip 12 is fed down from the upper reel 10 over the rollers 13 and 14 to the lower reel, this lower reel being mounted upon the shaft 8 and being driven therefore synchronously with the picture apparatus. Immediately behind that portion of the film 12 between the rollers

13 and 14 is a diaphragm 15 having therein a ~~small~~ narrow slit 16.

Behind the diaphragm 15 is disposed the tube 17 of a manometric flame apparatus. The flame 18 of this apparatus is disposed immediately in front of a mirror 19 whereby the rays of light are focused upon the film through the slit 16. When the film 12 is in ~~its ordinary~~ position, there will therefore be a bright line of light thrown upon the face of the film ~~12~~. The manometric tube 17 extends down into a chamber 20 from which extends a gas pipe 21 leading to any suitable source of gas. Above the flame 18 is disposed a chimney 22 having baffle plates 23 therein, which chimney permits the outward passage of the products of combustion but prevents the flame 18 from being deflected by down drafts of air.

The front of the chamber 20 is provided with a diaphragm 24 and from this diaphragm there extends a megaphone 25 which as illustrated forms part of the camera body, this megaphone being of course enlarged at its forward or front end and gradually converging until it opens into the diaphragm chamber.

It is to be understood, of course, that the film used for taking the moving pictures is shifted intermittently by mechanism as ordinarily used in moving picture machines, while the film which is used for taking the sound record moves steadily and continuously. The film or strip 12 and the film or strip upon which the moving pictures are to be taken is the same as the ordinary negative moving picture films.

While I have illustrated a manometric flame for the purpose of photographically recording sound upon the

film 12, I wish it understood that I may use a speaking arc in place of the manometric flame and that I do not wish to be limited to any particular apparatus for making this photographic sound record as it is obvious that many different forms of apparatus may be used for this purpose. The manometric flame apparatus is shown purely for purposes of illustration.

With the manometric flame apparatus, the operation of the camera is evident, the camera is intended to be used precisely the same as an ordinary moving picture camera. While the picture is being taken, the film of the picture taking apparatus moves intermittently as before stated while the film of the sound apparatus moves steadily. The vibrations of the air caused by the sound waves being recorded, affects the diaphragm in a way well understood, and this, in turn affects the manometric flame. The variations of pressure in the manometric tube 17 ~~caused thereby~~ will cause variations in the intensity of the flame and consequently variations in the rays of light passing through the slit 16. As a consequence a photographic record of the sound will be made upon the sensitized strip, this sound record showing the variations in intensity of the light just in proportion to the amplitude of the sound vibrations. The sound record shown in the developed negative film as alternately light and dark striations which while having the appearance of great irregularity, are in reality exceedingly regular and harmonic, only changing their order with the change of the ~~corresponding~~ sound vibrations ~~Each sound gives its own group of lines and the sounds~~ which may be easily recognized and read ~~from the photophonographic record so produced.~~

The record so produced and above referred to is the same form of record as is used in the photographone.

of Ruhmer and the reproduction of speech or sound from such a photophonographic record has been found to be astonishingly clear and quite strong, much clearer and purer than the reproduction of the ordinary wax cylinder phonograph. From a photographic sound record as above described, it is possible to secure many reproductions, each of which will reproduce back the original sounds with equal exactitude

B

It will be noted from what has gone before that so far the negative of the sound record and the negative of the picture record have been made upon separate strips or films. It is necessary, therefore, that these two negatives should be photographically printed upon one film or upon opposite sides thereof. In printing these records, the picture record would be printed as usual on one side of the moving picture film and fixed, the fixing solution however not being allowed to touch the other side of the film or strip. On the other side of the film there is a coating 4 of the substance before referred to which is impervious or opaque to infra-red rays, one such substance being very thin metallic silver. This substance which is opaque or impervious to the infra-red rays is combined with gelatine or other suitable medium. After the picture side of the film has been printed, this coating 4 is sensitized by brushing on a solution having a proper proportion of bichromate of potassium or bichromate of ammonium. This sensitizes the gelatine and makes it sensitive to light for photographic action. This coating 4 could not be sensitized previously as in printing the pictures the sensitiveness of the coating 4 to light would be destroyed. The gelatine medium wherein the thin metallic silver for instance is carried, would

simply act to hold this metallic silver or like substance and act as a transparent medium subject to the photographic action of light to thereby obtain a photographic record of the sound variations or sound record. The sound record which has been taken as previously described would be printed on the coating 4 of the film shown in Figs. 5 to 7^a by means of ordinary light, ordinary light affecting the now sensitized gelatin, and after printing in this manner the face 4 of the film is soaked in water which dissolves the gelatin that has not been acted on by the light. This soaking of the film will leave and take off horizontal stretches of transparent gelatin extending across the film, and leave or cut off the element or substance carried in the gelatin and which acts to cut off the infra-red rays. The horizontal stretches or lines of gelatin left upon the side 4 of the film corresponds to the sound record.

Thus on one side of the film 2 there would be a picture record to be reproduced by means of ordinary light, which light passes uninterruptedly through the clear transparent gelatin while on the other side would be the sound record formed by bands of gelatin corresponding to alternate light and dark lines on the negative and adapted to be reproduced by means of infra-red rays which would pass readily through the entire film except where purposely cut off by the substance impervious to red rays contained in the gelatin ~~bands or stretches~~ left upon the film. It is ~~again~~ reiterated that the white light would be entirely unaffected by passage through the coating 4 and that the infra-red rays while being affected by the coating 4 would be unaffected by the coating 3 containing the picture record.

Generally speaking, for the reproduction of the picture record and the sound record, ordinary white light

is passed through the picture record while infra-red rays (invisible to the eye) are passed through the sound record and fall upon suitable instruments to be hereafter described whereby these infra-red rays will cause the reproduction of sound vibrations. There are a number of instruments that are sensitive to infra-red rays. The tasimeter invented by Thomas A. Edison will measure heat accurately down to the ten-thousandth part of one degree, but this instrument is probably too sluggish for the purpose of reproducing sound record. The selenium cell when sensitized by Abney's process is sensitive to infra-red rays and may be used for the purpose. I believe, however, that the bolometer is best adapted for the purpose for several reasons, but principally because the element upon which the light falls can be made more nearly to coincide with the small horizontal lines of the photographic sound record. The width of the horizontal lines of the sound record would be regulated according to the speed of the film. Thus for instance where the Urban-Smith natural color films are used, these horizontal lines would be ~~larger~~ wider on account of the greater operating speed of these natural color films.

In the reproducing apparatus such as is hereafter described, infra-red rays are projected against the film containing the sound record and the picture record by suitable prisms such as prisms of rock salt, fluorite or Jena glass and focused through a narrow slit onto the film and after passing through the film fall on the reproducing instrument such as the bolometer. Connected in series with the bolometer or through similar apparatus would be loud-speaking phones such as the auristophone, the Edison or the Ducaret loud-speaking phones.

Moving pictures are reproduced by intermittently moving the film. It is therefore plain that it would be impossible to use this film during its intermittent motion or at the point through which the white light rays are projected for the purpose of reproducing the sound record, it being plain that the sound record must be reproduced as it was taken, namely, by a continuous ~~and uninterrupted~~ movement of the film. I overcome this difficulty therefore by passing the infra-red rays through the film at a point on one side or the other of the point where the picture projecting rays are passing through, that is, at a point where the film is moving continuously and steadily.

An apparatus whereby the moving pictures may be projected and the sound record synchronously reproduced, is illustrated in Fig. 1. This figure shows an ordinary moving picture projecting apparatus comprising a table or base 26 supported in any suitable manner and supporting upon it the lamp housing 27 wherein there is disposed the ordinary right angle arc lamp 28 such as used in moving picture machines. Such a right angle arc is particularly adapted as a source of infra-red rays while supplying at the same time the ordinary white light for the pictures. The light is projected from the lamp housing in any usual or suitable manner onto the film 2. This film is unrolled from an upper film reel and passes down through the usual moving picture projector 29. This mechanism contains means for intermittently shifting the film while the shutter of the mechanism is closed. Inasmuch as there are various types of this mechanism and it is thoroughly well known, it is not deemed advisable to describe the mechanism in detail.

The white light after passing through the fil
2 at the point a, is projected onto a screen A in the usual manner. The film after it passes below the aperture plate of the moving picture machine no longer moves intermittently but is ~~shifted~~ moved continuously and I have illustrated the film 2 as being passed around a series of rollers 30 and in front of the aperture of a selenium cell or like apparatus, this cell being designated 31. After passing in front of the aperture of the selenium cell the film 2 passes around a lower or receiving reel 32 which may be connected up with any suitable mechanism whereby the reel may be rotated continuously in a direction to wind up the reel 2 at a suitable rate of speed.

Disposed immediately below and in line with the meeting point between the carbons of the angular arc lamp 28, there are series of lenses 33. These lenses are preferably made of rock salt or fluorite. The infra-red rays passing through these lenses 33 are transmitted by means of prisms 33a of Jena glass or other suitable material to the aperture of the selenium cell 31. A diaphragm 34 is so disposed as to cause these rays to fall in the form of an elongated narrow or transversely extending beam upon the face of the selenium cell 31. Preferably the lenses 32 and the prisms 33a are contained within a casing or housing 35.

The selenium cell 31 is formed in any usual or suitable manner and requires no particular description as it is the ordinary form of cell except that preferably the cell is treated by Abney's process so as to make it extremely sensitive to the infra-red rays. Mounted behind the screen or in any suitable portion of the exhibition hall is a loud-speaking phone designated 36 in Fig. 1. This is a

loud-speaking electric telephone and is connected in series by the wires 37 with the selenium cell 31.

The operation of the picture and sound reproducing apparatus illustrated in Fig. 1 is of course obvious. The pictures are reproduced in the usual manner, but after the strip or film has passed beyond the specific moving picture mechanism, the strip passes in front of the selenium cell and the transverse bands or lines of the sound record on the film will act to more or less intercept, absorb, reflect or otherwise stop or impede the passage of the infra-red rays. Where the infra-red rays fall with full force upon the selenium cell, the cell will have a certain degree of electrical resistance. Where the infra-red rays are intercepted or their intensity changed in any manner, the electrical resistance of the selenium cell will vary correspondingly. There will therefore be a constant variation of the electrical resistance of the cell as the record film passes in front of the cell, and this continual variation of resistance will, in a manner well known, affect the receiver of the telephone transmitter 36 and thereby cause vibrations of the air corresponding to the sound vibrations and the sound will be reproduced. All of the mechanism heretofore described is well known by itself. The photophone operates on the same principle as the sound reproducing mechanism heretofore described, but using ordinary white light.

Inasmuch as sound reproductions may be secured by a large variety of electrical apparatus, affected by variations of rays falling upon it, I do not wish to be limited to the use of a selenium cell or any other specific apparatus for the purpose of translating the photographic

sound records into air vibrations as any other mechanism having the same general function may be substituted for the selenium cell.

For purposes of illustration, I have shown in Figs. 9 and 10 two other forms of mechanism adapted to translate the vibrations of light rays into sound. Fig. 9 illustrates the bolometer as used for this purpose. The bolometer will measure heat accurately down to the ten-millionth part of a degree. In Fig. 9 38 and 39 indicate two thin platinum strips forming the two arms of a Wheatstone bridge normally in perfect balance. The infra-red rays passing through the film 2 in the form of a thin beam fall on one of these arms or strips, namely the strip 39. This disturbs the balance of the bridge. This Wheatstone bridge is connected as illustrated in the diagram to a telephone transmitter 40 which is the transmitter of any one of the loud-speaking phones previously referred to. The current passing through this transmitter will vary in correspondence with the variations of the red rays falling upon the strip 39 and therefore the photographic sound record will be reproduced as air vibrations. The action of this instrument is virtually instantaneous in its operation and extremely sensitive.

Figure 10 is a diagram of the Edison tasimeter which may also be used for the purpose of translating photographic sounds into sound vibrations. In this figure 41 illustrates a rod of vulcanite supported against a fixed abutment at one end and at the other end abutting against a movable disk 42. This disk bears in turn against a carbon button 43 disposed between the movable disk 42 and a fixed disk of metal 42a. The two metal disks 42 and

42[a] are connected in circuit to a loud-speaking phone 45, the current passing more or less between the disks 42 and 42[a] through the carbon button as it is compressed. The variations in these red rays cause this vulcanite to contract and expand thus compressing the carbon button 43 between the metal pieces 42 and 42[a], causing variations in the current corresponding to the variations in the strength of the rays. ~~This is extremely sensitive and forms one means of translating the photographic record into sound vibrations.~~

While I have illustrated three forms of electrical sound reproducing apparatus, I wish it understood that I may use other forms. Thus I might use a thermopile, especially a "Bi-Ag", a selenium cell made sensitive to infra-red rays by Abney's process, or any other delicate heat measuring instrument of like character.

While in Fig. 1 and Figs. 9 and 10 I have shown only one telephone transmitter, this transmitter being shown in Fig. 1 as being disposed behind the screen A, it will be understood that with the electrical sound reproducing apparatus I may use a plurality of telephone transmitters disposed at various portions of an amusement hall, not only behind the screen but at the sides of the hall. This is obviously of great advantage and is not possible where ordinary sound reproducing mechanism is used.

Such an arrangement of phones is illustrated in Fig. 4 wherein the picture and sound projecting apparatus is designated 47 and illustrated diagrammatically, the picture being received upon the screen 48. As illustrated, there are three loud-speaking telephone receivers 49 disposed behind the screen 48 and a plurality of loud-speaking transmitters disposed along the side of the

hall and facing toward the audience. Thus the sounds reproduced may be distinctly heard by everybody in the audience. While I have illustrated in Fig. 4 all of the phones as being connected in one circuit and as being actuated by one selenium cell, bolometer or tasimeter, it is to be understood that when a film like that shown in Fig. 8 is used with two records placed in parallel position upon the film, a plurality of sets of sound reproducing apparatus is to be used. Thus with the film shown in Fig. 9 there will be two beams of infra-red rays projected through the film, each falling upon a separate bolometer, tasimeter or like apparatus, and each such reproducing mechanism being electrically connected to one of a series of sets of phonographic transmitters. By using the film shown in Fig. 8, a dialogue may be reproduced so that the sounds will issue from transmitters set at opposite sides of the hall or at opposite points behind the screen, thus causing the dialogue to seem more natural than if it apparently issues from one point only. It is obvious that a larger number of records could be placed upon the same film and thus the sounds be caused to issue from a plurality of points behind the screen or around the hall.

The two main features of my invention upon which the invention is based are in the first place the provision of a film capable of receiving not only the photographic prints of the pictures to be projected, but also the photographic record of the sound and the use with these films of invisible rays for the purpose of reproducing the sound record. The other important and vital feature of my invention resides in the provision of means whereby the sound record may be taken from [illegible] portion of the film which is

moving continuously while that part of the film through which the rays of white light are projected is moved intermittently.

In printing the sound record upon the strip or film 2, the sound record is started a sufficient distance beyond the starting point of the picture record so that at the instant that any one event is being projected on the line x, the sound record corresponding to this event is passing the axis of line z. Inasmuch as in taking or making the picture record and the sound record two separate negative films or strips are used, it is entirely possible in printing these records upon the film 2^a to displace the sound record with relation to the picture record in the manner stated. While I have shown the axis a of the infra-red beam as being about twelve inches below the axis x of the white light beam, I wish it understood that the two axes may be much nearer than this and that the drawing in Fig. 1 is purely illustrative in this regard, and further that I may pass the infra-red rays through the strip 2^a above the picture projecting mechanism and above the axis x

~~While I have referred to gelatine as being the~~ medium for carrying the substance which will intercept the invisible rays or be opaque thereto, I wish it understood that I may use a film composed of a body of collodion or other similar substance which will be flexible ~~and permit the passage of both visible and invisible rays.~~ While I have referred to the lenses and prisms for focusing and transmitting the invisible rays as being made of rock salt, or Jena glass, it is of course obvious that they may be made of other material such as flourite, or that I may use metallic reflectors.

By using a film having thereon a plurality of sound records, great naturalness could be secured as before stated by the fact that the transmitters translating the variations in the sound record into sound vibrations, could be located nearer to or farther from the inner side of the screen, or could be located on opposite lateral sides of the screen or stage so that the voices will apparently be projected in accordance with the positions of the actors in the moving picture. It is obvious also that in place of using a camera having a megaphone for transmitting sounds to the "speaking arc" or the manometric flame, sensitive microphone transmitters might be used at various portions of a stage upon which actors were acting a moving picture play, and that the vibrations of these microphones could be transmitted electrically to diaphragms placed within a camera to thereby transmit the sounds proceeding from the several microphones to the several flames or speaking arcs to be recorded in separate columns upon the sound record film.

The double or plural record illustrated in Fig. 8 could also be used to carry two or more languages. This would be of value in lecture courses. In many cities of the United States, moving picture films are first used in theatres frequented by English speaking persons and afterwards used in theatres where other languages are spoken, such as the Italian or Mexican theatres. It is obvious that where the moving picture dialogue is given originally in English and Spanish, for instance, and this English and Spanish dialogue is recorded upon the same film, it would be possible to reproduce either the English dialogue in connection with the moving picture film or repro-

Spanish dialogue. By separating the audience, two languages might be reproduced simultaneously while one picture was reproduced upon the screen. Likewise these plural records could be used for recording and reproducing music of separate instruments, or vocal music and an instrumental accompaniment. I wish it understood that all of these uses above outlined are within the scope of my invention.

In Fig. 11 I show diagrammatically a "Bi-Ag" thermopile as above referred to. As this thermopile is well-known an extended description is not necessary. The thermopile consists of a frame 50 having an opening at its middle and extending across this opening are a plurality of couples 52 composed of connected bismuth and silver wires. These couples are joined by overlapping plates of tin, the junctions formed by the plates being covered with platinum black. The frame 50 with its couples of platinum and silver is supported inside of a casing 51 having a narrow slit through which the infra-red rays are projected upon the junction plates. The couples of silver and bismuth are connected in circuit with a receiver of a loud-speaking telephone in the manner heretofore described. A thermopile of this character is fully described in Bulletin No. 4 issued by the Bureau of Standards on Instruments and Methods of Radiometry. Therefore no extended description of the thermopile is necessary.

In case the talking picture machine before described is desired to be used in very large theatres where it would take a sound a perceptible time to travel the distance and where it would be possible to see the picture, therefore, before hearing its corresponding sound, the following arrangement could be made. After the system has been brought to a standard the instrument sensitive to the infra-red rays would always be just a certain distance from the lens or just a certain number of pictures below the lens. In a large theatre, therefore, it would be only necessary to slightly advance the instrument, that is, move it a bit nearer to the lens, in which case the sound of a given event would slightly precede the picture but the sound would reach the observer at the same time that the picture was shown.

What I claim is:

-1-

~~A composite picture and sound recording film~~ having thereon a series of consecutive pictures and a corresponding photographic sound record.

Cancelled per

1. A composite picture and sound recording film having on one side thereof a series of consecutive pictures and on the other side thereof a corresponding photographic sound record, the records being in overlapped relation.

2. A composite picture and sound recording film having on one side a series of consecutive pictures formed to permit the passage of invisible light rays and on the other side thereof a corresponding photographic sound record formed to permit the passage of visible rays but to intercept or affect the passage of invisible rays, the records being in overlapped relation.

3. A composite picture and sound recording film having in conjunction a series of consecutive pictures adapted to permit the passage of invisible light rays and having in conjunction therewith a corresponding photographic sound record adapted to permit the passage of invisible light rays, the records being in overlapped relation

4. A composite picture and sound recording film having on one side a series of consecutive pictures adapted to permit or affect the passage of visible rays of white light and having on the other side and superposed upon

the pictures a corresponding photographic sound record adapted to permit the free passage of rays of visible light but to intercept or affect the passage of rays of invisible light.

5. A composite picture and sound recording film having thereon a series of consecutive pictures adapted to affect or intercept the passage of rays of visible light and on the other side a corresponding photographic sound record adapted to intercept or affect the passage of infra-red rays, The records being in overlapped relation.

6. A composite picture and sound recording film for moving picture talking machines, of transparent material having on one side a picture record affecting rays of ordinary visible light, and on the other side a sound record permitting the passage of ordinary visible light but affecting or intercepting the passage of invisible light rays, The records being in overlapped relation.

7. A composite picture and sound recording film for moving picture talking machines having on one side a series of consecutive pictures intercepting or affecting the passage of white and visible light and having on the other side and extending entirely across the film a photographic sound record formed of a substance permitting the free passage of ordinary white light rays but affecting or intercepting the passage of invisible light rays.

8. A sound recording film having thereon a photographic medium and a ~~substance~~ medium adapted to cut off, intercept or otherwise affect rays of invisible light, the medium being in overlapped relation.

-10-

The combination with a sound record comprising a transparent film having thereon a photographic sound record composed of a substance which will intercept, cut off or affect the passage of invisible light, of electrical means for reproducing sound, and means for affecting the current passing through the sound reproducing means, said last named means being in turn affected in its electrical action by the rays passing through said film.

9. ~~-11-~~ A sound recording film having thereon a photographic sound record composed of a substance having a high percentage of water of crystallization or a high percentage of water of constitution, a high percentage of selective reflection or a high percentage of selective absorption.

10. ~~-12-~~ A photographic sound record comprising a transparent film having thereon a sensitive coating comprising a substance having a high percentage of water of crystallization or a high percentage of water of constitution, a high percentage of selective reflection or a high percentage of selective absorption, and a medium carrying said substance and subject to the photographic action whereby the sound records may be photographically obtained.

11. ~~-13-~~

A sound reproducing and moving picture film of material transparent to visible and invisible light having on one side a picture record and on the other side a photographic sound record, the picture record being of material permitting the free passage of light rays beyond or below the visible spectrum but intercepting or affecting light rays proceeding within the visible spectrum, the sound record being formed of material permitting the free passage of visible light rays but affecting or intercepting the passage of rays beyond the visible light spectrum, the records being in overlapped relation.

~~-14-~~

The method of making composite picture and sound record films which consists in taking photographic picture records on a negative film, taking photographic sound records on a negative film, printing the picture records on one side of a positive film, printing the photographic sound records on the other side of the film, said last named side having thereon a sensitive coating of material capable of affecting the passage of invisible rays but not affecting the passage of visible light rays.

13. ~~-15-~~

The method of making composite picture and sound record films which consists in taking photographic picture records on a negative film, taking photographic sound records on a negative film, printing the picture records on one side of a positive film transparent to visible and invisible light rays and printing the sound record on the

opposite side of the said film, said side having a photographically sensitized coating of material permitting the free passage of visible light rays but affecting or intercepting the passage of invisible light rays.

-16-

The method of displaying composite sound and corresponding picture records from a moving picture film which consists in intermittently moving the film at one portion thereof, steadily moving the film at another portion thereof, projecting light through the picture record at the intermittently moving portion of the film to display the pictures thereon and projecting light through the sound record at the steadily moving portion of the film and translating the variations of said light into sound vibrations.

-17-

The method of displaying a composite sound record and moving picture film which consists in intermittently moving the film at one portion thereof, steadily moving the film at another portion thereof, projecting light through the picture record at the intermittently moving portion of the film to display the picture thereon, and projecting light through the sound record at the steadily moving portion of the film, allowing said last named rays of light to fall upon an element whose conductivity or resistance will vary to correspond with the variations of said light rays and translating said variations in conductivity or resistance into sound vibrations.

-18-

The combination with a composite sound and picture

record comprising a film transparent to visible and invisible light, said film having thereon a photographic picture record adapted to permit the free passage of rays of invisible light but to intercept or affect the passage of rays of visible light and having thereon a sound record composed of a substance adapted to permit the free passage of rays of visible light but intercept or affect the rays of invisible light, of means for intermittently moving one portion of the film, means for steadily moving another portion of the film, means for projecting a beam of visible light through the intermittently moving portion of the film, means for projecting a beam of invisible light through the steadily moving portion of the film, and means in the path of said last named beam for translating the light variations of the beam into sound vibrations.

-19-

Means for reproducing moving pictures and corresponding sounds including a film transparent to visible and invisible light rays and having on one side thereof a series of consecutive photographic pictures adapted to permit the free passage of invisible rays but intercept or affect the passage of visible rays of light and on the other side a sound record adapted to permit the free passage of rays of visible light but intercept or affect the passage of invisible rays, a source of visible light rays, means for intermittently moving the film across a beam of light proceeding from said source to thereby project moving pictures, a source of invisible rays, means for steadily moving the film across a beam proceeding from said source of invisible rays to thereby project the sound record, and means in the path of said last named rays after they pass through the

film adapted to translate the variations of intensity in said beam of invisible rays into sound vibrations.

-20-

Means for reproducing moving pictures and corresponding sounds including a source of visible rays and a source of invisible rays, a moving picture film having on one side thereof a series of consecutive pictures designed to affect the passage of visible rays but permitting the free passage of invisible rays and having on the other side thereof a sound record adapted to affect the passage of invisible rays but permit the free passage of visible rays, means for intermittently moving the film across a beam proceeding from the source of visible rays, means for steadily moving the film across the beam of rays proceeding from the source of invisible rays, a telephone transmitter, and a receiver upon which the beam of invisible rays fall, said receiver being connected in series with the telephone transmitter, the resistance or conductivity of the receiver being altered by being subject to invisible rays.

-21-

Means for reproducing moving pictures and corresponding sounds including an electric lamp having angularly disposed carbons, means for projecting visible light rays from the meeting points of said carbons, means for projecting invisible rays from the meeting points of said carbons in a path separate from the path of the visible rays, a film having thereon a series of consecutive photographic pictures adapted to intercept or affect the passage of visible rays and having a sound record adapted to permit

the free passage of visible rays but to intercept or affect the passage of invisible rays, means for intermittently shifting the film across the path of the visible rays to thereby project the moving pictures, and means for steadily moving the film across the path of the invisible rays to thereby project the sound record, means for translating the variations in the invisible rays into sound comprising a receiver electrically sensitive to the action of invisible rays, and a transmitter electrically connected to said receiver.

-22-

A camera for taking moving pictures and simultaneous corresponding sound records, said camera being divided into two compartments, a moving picture film mounted in one of said compartments, means for intermittently moving said film, photographic lenses coacting therewith, a steadily moving photographic film in the other compartment, a source of light, means for condensing rays from said source of light upon said last named film, a megaphone, and means acted upon by the sound vibrations in said megaphone affecting the intensity of the light in correspondence with said sound vibrations.

-23-

The combination with a moving picture camera including film feeding means, of a sound recording camera including film feeding means, a source of light, means for causing a beam of light to fall upon the film, means for causing sound vibrations to correspondingly affect the beam of light to thereby form a photographic record of said variations upon the film, and means for synchronously feeding both of said films.

-24-

A camera for taking moving pictures and coincidentally making a photographic sound record, comprising a camera compartment, means therein for photographically taking moving pictures upon a film, a conjoined compartment, reels therein, a sound record photographic film mounted upon said reels and moving before a slit, a manometric tube disposed behind the slit, a chamber from which said tube extends, said chamber being connected to a source of gas, a diaphragm forming one wall of the chamber, and a megaphone forming the lower portion of the camera but connected to said diaphragm.

-25-

A sound record film for sound reproducing machines having thereon a plurality of parallel records.

-26-

The combination with a sound record film having thereon a plurality of parallel sound records, of separate means of reproducing said records simultaneously.

-27-

A sound reproducing film having thereon a plurality of columns of correlated sound records, and photographenic means for reproducing said records.

~~-28-~~

18. A sound recording film comprising a strip transparent to visible and invisible rays and having thereon a plurality of correlated sound records, the sound records being formed by a substance intercepting or affecting the passage of invisible rays, means for passing invisible

Reserved for [illegible]

rays through said sound records, and means for translating the variations in intensity of said rays into sound vibrations.

-29-

The combination with a transparent film having thereon a plurality of sound records formed of a substance intercepting or affecting the passage of invisible rays, and means for steadily moving said film, of a receiver adapted to have its electrical conductivity or resistance varied by the action of invisible rays, means for projecting invisible rays through said film upon said receiver, and a plurality of telephone transmitters connected in series with said receiver.

13. A film for use in reproducing pictures and sound in synchronism having thereon a plurality of photographic records, each adapted to intercept or affect a certain class of light rays and permit rays of another class to pass unimpeded therethrough, each record intercepting or affecting that class of light rays which is permitted by the other record to pass freely, the records being in overlapped relation.

14. A film for use in reproducing pictures and sound in synchronism having thereon a plurality of superimposed photographic records, each adapted to intercept or affect a certain class of light rays and permit rays of another class to pass unimpeded therethrough, each record intercepting or affecting that class of light rays which is permitted by the other record to pass freely, the records being in overlapped relation.

Cl. 13

A film for coincidentally reproducing moving pictures and sound, said film having conjoined thereon a sound record and a consecutive series of pictures.

-33-

The combination with means for projecting a plurality of different classes of light rays, of a film movable in the path of said light rays, said film having thereon a plurality of records, each of said records affecting or being more or less opaque to the passage of a certain class of light rays but permitting the free passage of another class of light rays, the rays permitted to pass by one record being of another set from those rays permitted to pass by any other record.

-34-

Means for reproducing sound in connection with moving pictures including a film having thereon a consecutive series of moving picture photographs and a consecutive series of sound reflexes constituting a record, the sound reflexes corresponding to any particular event displayed on any one picture being longitudinally spaced on said film from said correlated picture, means for intermittently moving one portion of the film, means for steadily moving another portion of the film, means for projecting the said pictures at the intermittently moving portion of the film, and means operatively affected by the sound record and located at the steadily moving portion of the film, the distance between the picture projecting and the sound reproducing devices being equal to the distance between any one picture and the correlated corresponding portion of the sound record.

Means for reproducing sound in connection with moving pictures including a source of white light, a source of rays beyond the visible spectrum, a film having a consecutive series of picture records and a correlated sound record, the picture record being transparent to invisible rays but affecting visible rays, the sound record unaffecting the visible rays but affecting the passage of invisible rays, the sound record correlated with any specific event on any one picture of the series being longitudinally spaced therefrom along the film, means for passing said film in the paths of the visible and invisible rays, and means acted upon by the invisible rays passing through the film for translating the variations in intensity of said invisible rays into sound vibrations.

In Testimony Whereof I affix my signature in presence of two witnesses.

(Sign here First name in FULL.) Richard M Craig.

(Two witnesses sign here.) W. M. Book.

D B Shanes

OATH.

State of Texas, } ss:
County of Bexar, }

I, Richard M. Craig,

the above-named petitioner being sworn, depose and say that I am a citizen of the United States and resident of San Antonio, in the County of Bexar, and State of Texas, that I verily believe myself to be the original, first, and sole inventor of the improvements in Phonographic Attachment for Moving Picture Machines,

described and claimed in the annexed specification; that I do not know and do not believe that the same was ever known or used before my invention or discovery thereof, or patented or described in any printed publication in any country before my invention or discovery thereof, or more than two years prior to this application, or in public use or on sale in the United States for more than two years prior to this application; that said invention has not been patented in any country foreign to the United States on an application filed by me or my legal representatives or assigns more than twelve months prior to this application; and that no application for patent on said improvements has been filed by me or my representatives or assigns in any country foreign to the United States, ~~except as follows:~~ ( )

(Sign here First name in FULL.) Richard M Craig.

Sworn to and subscribed before me this 13 day of June 191

D B Craig
Official Signature

Notary Public Bexar County Texas
Title of Character

NOTE [illegible]

Div. 7 Room 312

Address only "The Commissioner of Patents, Washington, D. C."

M. Paper No. 2

All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON June 27, 1913.

JUN 27 1913

R. S. & A. B. Lacey,

Washington, D. C.

Please find below a communication from the EXAMINER in charge of the application of

Richard M. Craig, filed May 6, 1913, Phonographic Attachment for Moving Picture Machines, Serial #765,959.

E. B. Allsop

Commissioner of Patents.

Page 3, line 25, "film" should perhaps be sound record.

Page 4, lines 27 to 31, the correctness of the statement is doubted.

page 5, line 12, "will require" should be will be required; line 16, "at the same time" seems superfluous.

The brief description of Figure 11 should be supplied.

Page 12, line 1, "perpendicular" is not understood.

Page 14, line 15, "affects" should be affect.

Page 17, lines 19 to 22, are not understood.

45 is not found on the drawing. (Page 22, line 1). Page 22, line 4, "causes" should be cause.

Line z is not found on the drawing. (Page 24, line 9).

The use of reflectors referred to at the foot of page 24, is not understood.

Page 25, line 5, "further" should be farther.

Page 27, line 2, "further from" should perhaps be nearer to.

As understood, the film as shown in Fig. 7a has a picture record on one side, each record being more or less opaque in different parts because of the different degrees of deposit on the film. The areas of heaviest deposit on one side of the

film would seem in places to overlie the clearest portions of the other face of the film; and with such an arrangement, the deposit areas on the one side would hinder the passage of the light through the clearer portions of the other side of the film. It is not understood how deposits of such different natures are produced on the two sides of the film as to determine of themselves which rays can be transmitted by the respective deposits. As far as can be understood, the deposits are of the same nature, it not being understood how they are made different by the particular substances that applicant combines with the emulsions on the respectives faces of the film. Further explanation is therefore asked for on the above points.

Division is required between claims 1 to 8, 9, 11, 12, 13, 25, 30, 31, and 32, for the film; claims 10, 16 to 21, 26 to 29, 33 to 35 for the reproducing apparatus; claims 14 and 15 for the method of making the records; claim 22 to claim 24 for the taking apparatus. These are regarded as separate inventions and constitute subject matter for separate applications.

It is not clear whether claim 10 is intended to cover the film or the reproducing apparatus. This claim should include the light source if the apparatus is to be covered.

In claim 11, it is not clear whether the description applies to one and the same substance or to alternate substances. Likewise claim 12.

A cursory search shows the patent to :

Haines et al., (British), #18,057, of 1906;
(88--Sum. Dig.)

J. R. M.

W. B. Underwood

Examiner.

Amendment A Pat 3

JUN 1914

W-MCS. June 3, 1914. #5086-T

IN THE UNITED STATES PATENT OFFICE.

Richard M. Craig, Serial No. 765,959,

Moving Picture Machines,

Filed May 6, 1913.

U. S. Patent Office. Room No. 312.
JUN 5 1914
DIVISION VII.

Hon. Commissioner of Patents,

S I R:-

In response to Official action dated June 27, 1913, amendment is hereby made as follows:-

Page 3, line 25, change "film" to sound record

A Page 4, cancel from and including the word "In" on line 27 of page 4 to and including line 4 on page 5.

Page 5, line 12, before "require" insert be and same line cancel "to be made"

Line 16, cancel "at the same instant"

A1 Page 8, last line insert Fig. 11 is a diagrammatic view of another form of sound reproducing mechanism.

Page 12, lines 1 and 2 cancel "perpendicular"

Page 14, line 15, change "affects" to affect

Page 17, line 14, cancel "on account that" and substitute means

Same page, line 20, change "larger" to wider

Page 22, line 4, change "causes" to cause

Page 24, line 9, and line 14, change "z" to Z

Same page, last line after "reflectors" and before the period insert for deflecting the invisible rays along the line Z.

A2

Page 25, line 5, change "further" to farther

Page 27, line 7, change "further from" to nearer to

Cancel claim 1.

Change the ordinal of claim 2 to 1; 3 to 2 and line 3 after "rays" insert without affecting said rays

Change the ordinals of claims 4, 5, 6 and 7 to 3, 4, 5 and 6

Line 4 of former claim 7, present 6, after "light" insert but not affecting invisible light rays

Change the ordinal of claim 8 to 7 and 9 to 8

Cancel claim 10 and change the ordinal of claim 11 to 9; 12 to 10.

Change the ordinals of claims 13, 14 and 15 to 11, 12 and 13.

Cancel claims 16 to 27 inclusive and substitute:

12. The method of producing a motion picture and sounds corresponding to the action of the pictures which consists in passing rays of visible light and invisible light rays separately through a film, one side of said film being provided with photographic picture records acting to affect rays of visible light but not affecting invisible light rays, the other side of said film having superimposed thereon a photographic sound record of a substance which will affect invisible light rays but will not affect the visible light rays, causing the film to move at one p int intermittently and at another point continuously, causing the rays of visible light to pass through the intermittently moving portion of the film and the invisible rays to pass through the steadily moving portion of the film,

A3

and translating the variations in the invisible light rays into sound vibrations.

Change the ordinal of claim 28 to 15.

Cancel claim 29.

Change the ordinals of claims 30 and 31 to 16 and 17

Line 1 of present claim 16 cancel "speech" and substitute sound

Line 1 of present claim 17 cancel "speech" and substitute sound

Cancel claims 32, 33, 34 and 35 and substitute:

The method of reproducing a plurality of different records from a single moving film, consisting in moving a film across the paths of a plurality of different classes of light rays, said film having thereon a plurality of superposed records, each of said records affecting or being more or less opaque to the passage of a certain class of light rays but permitting the free passage of another class of light rays, the rays permitted to pass by one record being of another set or class from those permitted to pass by any other record.

REMARKS

With regard to lines 19 to 22 of page 17 the sound record will consist of transverse lines spaced apart a certain distance from each other and of greater or less intensity, depending upon the sound recorded. The width of the lines will depend upon the rapidity with which the record moves, and where the operating speed of the film is necessarily great in order to properly reproduce the pictures, these lines must be relatively wider than they would

be where the operating speed was lower.

The objection of the Examiner contained in the last four lines on page 1 of the Office action and the first twelve lines of page 2, is not understood, and it is believed that the Examiner mis-understands applicant's invention. The Examiner states that "the film as shown in Fig. 7B has a picture record one one side, a sound record on the other, each record being more or less opaque in different parts....." The Examiner is asked to note that these records are more or less opaque only to the particular species of rays which they affect,--thus the record on one side is entirely transparent with regard to ordinary rays of light but is only more or less opaque with relation to the infra-red rays, while the photographic picture record is more or less opaque to ordinary light rays but is entirely transparent to the infra-red rays. Thus the areas of heaviest deposit on one side although they overlie the clearest portions of the other face of the film do not affect the passage of light therethrough. The Examiner states that "The areas of heaviest deposit on one side etc." The Examiner will conceive applicant's invention better if he does not regard this as an opaque deposit but will assume that there is upon one face of the film an apparently perfectly transparent medium which, however, contains in it an apparently perfectly transparent chemical which will not affect and freely permits the passage of visible rays but which will affect the passage of invisible rays. This is analogous to the action of bodies interfering with the passage of the X-ray. Certain material is absolutely opaque to the passage of white light but it is practically transparent to the passage of X-rays, while on the other

hand material which is transparent to the passage of X-rays is opaque to the passage of rays of ordinary light.

If the Examiner does not believe that there is any material which can be used photographically and which will permit the passage of rays of ordinary light but will be more or less opaque to the action of the infra-red rays, applicant will be glad to furnish authority for his statements.

The claims now left in this case cover the film, but with the claims upon the film, applicant has also included claims upon the method of making the film and claims upon the method of using the film. Where a method and the article are so closely allied that the article cannot be produced by any other method nor can the method be used except to produce that article, the Office has always allowed the claims to remain in the same case, and that is exactly the state of affairs in this case. The film cannot produce the picture by itself. The operation cannot be produced with any other film and the film cannot be reproduced except by the use of invisible rays and ordinary light rays.

It is believed that these three sets of claims should remain in one case and that this is contemplating the Rule 41 of the Rules of Practice.

Attention is called to the following decisions:

Cowper-Coles, 1 C. C. 681, 1902, where it is held that division should not be required between claims to a process for depositing zinc on metallic surfaces, and claims to the article produced, where there is doubt as to the possibility of producing the article by any other process and the process will not produce any other article.

Adams, 106, O.G. 541, held that division should not be required where the process necessarily results

in the article although "it is probable that the composition (article) might be produced by other processes".

Again, in Dallas, 106, O. G. 996, it was held that where the process set forth in some claims necessarily produced the product set forth in others, and there is a close relationship betweem them, although it is possible that the product might be made by other processes, the claims may be retained in one application.

In Leavitt, 13 Gour., 36-12, June 1901, it was held that an applicant presenting process claims in the same application with product claims and some of the process claims were so broad that it was not apparent that the product could be made with any other process, or that the process could result in any other, while others were narrower and divisible from the product claims, held that the merits of the broad process claims and of the article claims should be considered in the same application and that if the state of the art did not warrant the allowance of such broad claims the product claims should be divided from the remaining process claims and prosecuted separately.

In Ives, 15 Gour. 23-24, March, 1913, it was held that division was not required between claims for a photograph and claims for the process of making the photograph, both being new. This is certainly on all fours with the present case.

With regard to the English reference cited, while this shows a film having a photographic sound record and a photographic picture record, yet this film does not meet the terms of applicant's claims for the reason that the sound record is disposed at one side of the film and does not overlie the picture record and further, that in Haines there is no suggestion of the sound record being worked by infra-red rays.

Reconsideration is asked.

Respectfully submitted,

R. S. & A. B. Facey

Attys. for Craig.

1056

7 Room 312

2-830

M. Paper No. 4

All communications respecting this application should give the serial number, date of filing, title of invention, and name of the applicant.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON July 21, 1914.

U.S. PATENT OFFICE JUL 21 1914 MAILED

R. S. & A. B. Lacey,

Washington, D. C.

Please find below a communication from the EXAMINER in charge of the application of

R. M. Craig, filed May 6, 1913, Phonographic Attachment for Moving Picture Machines, Serial #765,959.

Thomas Ewing

Commissioner of Patents.

Case reconsidered as amended June 4, 1914.

Page 5, line 12, "require" should be required.

Reference numeral "45" is still not found on the drawing.

The misjcinder of invention has not been relieved, as claim 15 relates to apparatus while other claims before mentioned cover the film. All the claims must be directed towards the same invention before action on the merits may be had. As far as can be now understood the combined record would seem to be capable of being made by other methods than that outlined by applicant in claims 12 - 13 and should not be treated in the same application with the article claims. The requirement for division between these method claims and the article claims is therefore repeated. It is possible however that the examiner's position might be changed on this point upon the examination of applicant's authorities below requested. Claims 14 and 18 are thought not to state a proper method, but merely the obvious and necessary operation of the film. These claims are accordingly rejected.

The examiner is not yet satisfied as to the ability of the substances mentioned by applicant to act in the manner claimed;

If however these claims should be interpreted so broadly as not to necessarily include pictures and sound records, then they must be regarded as being for a broader and different invention than that included in the synchronization of pictures and sounds, and would therefore be divisible therefrom.

Authority is also asked for as to the use of rock salt and fluorite for the purpose stated by applicant. In this connection attention is called to the following publications, copies of which are to be found in the U.S.Patent Office Scientific Library:

"Experimental Physics" by Weinhard page 811."
"Light, Visible and Invisible" by Silvanus P.Thompson pages 165-166 and pages 198-199".

Applicant should make it very clear just what is the composition of the emulsion used for the sound record, and this proposition as well as that concerning the structure of the condensing lenses must be supported by particular authority.

L. T. Underwood

Examiner, Div. 7.

FGS-GS December 8, 1914. 5086-T

IN THE UNITED STATES PATENT OFFICE.

Richard M. Craig, Serial No. 765,959.

Phonographic Attachments for Moving Picture Machines,

Filed May 6, 1913, Room No. 312.

U. S. Patent Office
DEC 10 1914
DIVISION VII.

Hon. Commissioner of Patents,

S I R:

Responsive to Official action of July 21, 1914, amendment is hereby made as follows:

Page 3, line 14, correct the spelling of "synchronism"

Page 5, line 12, erase "require" and insert: required

Page 7, line 1, after "impervious" insert: to

Page 9, line 11, erase "without being visible and" Same page, line 13, erase "picture" and insert: film Line 14, erase "strip" Line 17, erase "the" (first occurrance) Line 23, after "which" insert: latter Line 24, erase "which" Line 25, erase "record"

Page 10, line 5, after "rays" insert: and more or less completely intercept the visible rays Line 12, erase "white" and insert: visible Line 14, erase "impervious" and insert: pervious Line 28, erase "ordinary" and insert: visible Last line, correct the spelling of cut

Page 11, line 6, pluralize "ray" Line 9, after "acting" insert: as Line 19, before "substance" insert: a Line 23, erase "said" Line 27, erase "illustrated" and insert: illustrates

Page 12, line 30, erase "a" and insert: the

Page 13, line 1, erase "small" Line 7, after "film" insert: 12 Same line, erase "its ordinary" Line 9,

erase "12"

Page 14, line 11, erase "When" and insert: While Line 14, erase "sounds" and insert: sound waves Line 17, erase "caused thereby" Line 18, before "flame" insert: intensity of the Same line, erase "thus" and insert: consequently Line 19, erase "into" and insert: through Line 20, erase "formed" and insert: made Line 22, before "of" insert: in intensity Line 23, after "shows" insert: in the developed negative film Line 24, erase "stripe" and insert: striations Line 29, erase "of" and insert: in Same line, erase "corresponding" Same line, after "sound" insert: vibrations of which they are a record Erase the sentence beginning in this line.

Page 15, line 7, erase "back"

Page 16, line 13, before "leave" insert: therefore Line 15, after "lines" insert: of vertical striations Line 26, erase "bands or stretches" Line 27, erase "again"

Page 17, line 14, erase the word "means" inserted by amendment and insert: because

Page 18, line 7, erase "and unintermittent"

Page 21, line 26, before "records" insert: sound

Page 22, line 1, erase "45" Erase the sentence beginning in line 8.

Page 24, erase the sentence beginning in line 22.

Page 25, line 7, pluralize "voice" Line 8, erase "to" and insert: with Same line, pluralize "position" Same page, erase the paragraph beginning in line 20 and ending on page 26.

Page 26, line 13, after "couples" insert: 52

Cancel claim 15 and renumber the remaining claims as 1 to 17 inclusive.

Enter the following claims:

16. A composite picture and sound recording film having on one side thereof a photographic record and on the other side a photographic record, the records being overlapped.

17. A composite picture and sound recording film having opposed photographic and transparent photographic records.

18. A composite picture and sound recording film having opposed surfaces sensitized for the individual impression thereon of photographic and photographic records.

19. A negative film for the negative impression of picture and sound records having its opposed surfaces sensitized one for the photographic impression of a picture and the other sensitized for the photographic impression of a related sound, the sensitized medium of the last-mentioned surface of the film being pervious to visible light rays.

20. A positive film for the reproduction of picture and sound records having upon one surface a positive picture record pervious to ~~visible and~~ invisible light rays and provided upon its other surface and directly opposite the picture record with a positive sound record pervious to visible light rays and more or less impervious to invisible light rays.

(Copy)

R E M A R K S:

The Examiner has requested a citation of the applicant's authority upon which are based certain state-

ments made in the specification. In response to a request for such a statement from the applicant, attorneys are in receipt of a letter which it is believed contains the desired information. The applicant states in substance in his said letter that the ordinary moving picture film permits infra-red rays to pass freely as, of course, also the visible light rays, the latter in degree according to the intensity of the impression upon the film. He states that in devising his invention, the problem arose to provide some material which would intercept to a greater or less degree the infra-red rays and which would yet be transparent so as not to interfere with the visible light rays, and which material or substance could be applied to that face of the film directly opposite the face containing the photographic impression. He found that metallic silver could be rendered so thin as to be pervious to visible light rays and yet it would intercept the infra-red rays. The photographone is an instrument well known and by its use sounds may be recorded on a film by means of visible light rays, the film being of course sensitized and the impression of the sound waves being translated thereto by the variation in the intensity of the light. However, the photographonic film record employed in connection with this instrument is in the nature of a negative and is of course, when developed, more or less impervious to visible light rays. Consequently, such a record could not be made upon the obverse side of a moving picture film, as to do so would interfere with the projection of the photographic picture record. In the film mentioned, the sound waves are recorded through the medium of visible light rays. The applicant therefore perceived the necessity of producing a record which could be reproduced through the medium of

invisible or infra-red rays, and which record would not interfere with the passage of visible light rays, so that the sound record could be produced upon one face of the moving picture film and the picture record upon the other face, each record occupying the entire width of the film and the necessity of providing a film of greater width than the standard film being therefore obviated. The applicant makes mention of a few of the works which he has read upon the subject in general and a list of these works is given below: -

The Construction of A Sensitive Galvanometer for Spectro Bolometric Purposes, by C. G. Abbott.

The absorption of Water Vapor in the infra-Red Solar Spectrum, by F. E. Fowle.

Radiometric Investigation of Water of Crystallization, Light Filters and Standard Absorption Bands, by W. W. Coblentz.

Radiometric Investigations of Infra-red Absorption and Reflection Spectra, by W. W. Coblentz.

Instruments and Methods Used in Radiometry, by W. W. Coblentz.

Selective Radiation from Various Substances, by W. W. Coblentz,

Selective Radiation from Various Solids, by W. W. Coblentz.

Solar-Radiation Researches by Jules Cesar Janssen, by A. de la Baume Pluvinel,

The discrepancy between the Solar Radiation Measures by the Actinometer and by the Spectre Bolometer, by F. E. Fowle.

The Reflecting Power of Various Metals, by W. W. Coblents.

The Wireless Telephone, by Ernest J. Ruhmer

The Photophone, by A. Graham Bell.

Production of Sound by Radiant Energy, by A. Graham Bell.

Selenium Properties and Applications, by W. J. Hammer.

The New Spectrum, by S. P. Langley.

It is thought that if the Examiner will consult these authorities he will appreciate the feasibility of the applicant's invention. It is also believed that, in the light of the above mentioned authorities, the Examiner will appreciate the fact that the film disclosed by the applicant could not possible be produced in any manner other than by the method stated in his specification. This being the case, the decisions noted in the amendment of June 4th, 1914, are in point, and the requirement for division should be withdrawn. The Examiner will note that claim 15 has been canceled in view of the objection raised against the same.

As concerns claims 14 and 17 (the latter was formerly claim 18 presented by the amendment mentioned), attorneys would state that it does not appear to them that these claims state merely the obvious and necessary operation of the film. They disclose a novel method of reproducing in synchronism a sound and a picture record. While the claims in question may make mention of the movement of the film and the reproduction of the two records, it is believed that they, as a matter of fact, truly discribe a novel method for producing simultaneously and in synchronism motion pictures and related sounds.

Attorneys take this opportunity to briefly discuss

the patents cited by the Examiner in the above noted Official action. The patent to Dupuis discloses no more than a bare idea. There is nothing in the specification of this patent to show that the patentee had in mind any definite means for accomplishing the results which he briefly describes therein, and, in fact, it appears that his idea was to have upon one face of a moving picture film a photographic record, which, of course, in order to depict the images, would be more or less opaque, and to produce upon the other face of the film a sound record. So far as there is anything in the record to show to the contrary, the applicant is the first one to have ever conceived the idea of a transparent photographic record. It is to be presumed therefore that the only means of producing a phtographonic record at the command of the patentee was that well known in the preparation of the film for the photographone, in which event, the transversely extending series of striations upon the obverse side of the film would materially interfere with or entirely prevent the projection of the photographic record. In fact, the patentee in question states in the claim of his patent that his invention consists in an opaque moving picture film having a continuous movement at uniform speed, the film being characterized in that its face is arranged to receive images for the moving picture projection, and its obverse face is arranged to receive a graphonic record, the film being arranged to permit reproduction simultaneously and in synchronism of the sounds and images. It seems clear from the statements made by the patentee that unless the two records were relatively laterally displaced, the projection of the photographic record would be interfered with, if not

entirely prevented. It may be that the patentee had in mind the production of a sound record by some other means than through the medium of variations in the intensity of a light to which the film was subjected. As before stated, however, he discloses no means for carrying out his invention and therefore attorneys contend that the patent in question is void as a reference.

In the French patent to MacCarty, there is shown a film of greater than the standard width and divided longitudinally medially, the film at one side of its middle containing a picture record and at the other side containing a sound record. Not only is the film in the MacCarty patent produced in an entirely different manner (so far as concerns the sound record) from that by which the applicant's film is produced, but the sound record is more or less opaque, and it is for this reason that MacCarty found it necessary to locate the same laterally to one side of the picture record. From the foregoing, it is obvious that the French patent to DuPuis is not such a disclosure as would render it a valid reference and that the patent to MacCarty does not show the same idea of invention as disclosed by the applicant.

It is thought that the application is in condition for full and favorable action on the merits.

Respectfully submitted,

W. A. & W. B. Facey

Attys. for Rachard M. Craig.

Div. 7. Room 312 MI-PSC

Address only "The Commissioner of Patents, Washington, D. C." and not any official by name.

Paper No. 6.

All communications respecting this application should give the serial number, date of filing, title of invention, and name of the applicant.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON December 21, 1914.

R.S. & A.B.Lacey,

Washington, D.C.

U.S. PATENT OFFICE DEC 21 1914 MAILED

Please find below a communication from the EXAMINER in charge of the application of

R.M.Craig, for Phonographic Attachment for Moving Picture Machine filed May 6, 1913, Serial No. 765,959.

Thomas Ewing
Commissioner of Patents.

In response to amendment filed Dec 9, 1914.

On page 16, line 15, the word "striations" is not clear in this connection.

Attention is again called to reference numeral "45".

In reply to the Examiner's request for citation of authority applicant has furnished a list of fifteen works, but does not point out exactly where in these several publications the information is to be found. Thus applicant will be required to be more specific in pointing to his authority, so that it can be readily found by the Examiner.

Upon further review of the claims, it is found that claims 8 and 10 are apparently directed to cover the sensitive film which is regarded as a separate and independent invention from the film carrying the records and is properly examinable in another division of this office. New claims 20 and 21 belong to the same class, and these four claims are divisible from the other film claims and method claims before pointed out. New claims 18,19 and 22 are classed with the film record claims as grouped in the last requirement of division. With these modifications and additions, the requirement of division is repeated. Claims 16 and 17 are regarded as relating to the synchronization of pictures and sound, and they should be made [illegible] a reference to this combination.

that is, those substances used to produce the sound record on the positive film. Applicant is accordingly called upon to refer the examiner to his authority in this matter, especially in reference to the substances mentioned in paragraph 1, page 10, and also as to the statement on page 11, lines 2 - 3. In connection with the use of one of the substances named by applicant on page 10, namely thin metallic silver, attention is called to the article by Prof. R. W. Wood, entitled "Photography by Invisible Light", on page 380 of the Scientific American Nov. 15, 19[illegible] in which thin metallic silver is mentioned as being used as an ultra-violet screen.

In claim 13, line 5, "visible" should be canceled.

In claim 15, line 1, "recording" should be record.

The following patents are added:

McCarty, (French), #448,757, Dec. 5, 1912; (1 sheet);
Dupuis, (French), #372,785, March 1, 1907; (no drawings);
(88--16.2).

JTGM.

L. D. Underwood

Examiner.

Amendment A Paper No. 7

S/MOD Dec. 11, 1915. 5086-T

IN THE UNITED STATES PATENT OFFICE.

Richard W. Craig, Serial No. 765,959.

Phonographic Attachments for Moving Picture Machines,

Filed May 6, 1913, Room No. 318.

U. S. Patent Office
DEC 16 1915
DIVISION VII

Hon. Commissioner of Patents,

S I R:

In response to official action of December 21, 1914, amendment is hereby made as follows:-

Page 2, erase the sentence beginning in line 6.

Page 11, lines 28 and 29, erase "illustrated" and insert --illustrates--

Page 16, line 15, erase the matter inserted after the word "lines"

Page 19, line 5, erase "shifted" and insert --moved--

Page 21, line 25, erase "transmitting" and insert --translating--; Page 22, line 1, erase "45"

Claim 15, line 1, before "sound" insert --pictures and--; and in the same line after "sound" insert --in synchronism--

Make the same correction in line 1 of claim 16.

R E M A R K S:

Upon further correspondence with applicant it is found that the authorities noted in the last amendment were consulted in their entirety, that is to say applicant read and gave due consideration to the entire text of each book mentioned and his present invention is the result of such consideration of the said authorities. Applicant also states,

11353

concerning the use of rock salt and flourite, that he has considered in this connection the following authorities:

Dispersion of Rock Salt & Flourite in the Infra-red Spectrum. Report of Astrophysical Observatory, 1891-1901, Vo. 4222, Chapter 1, Page 219.

Comparison of Dispersion of Prisms (rock salt, flourite) Page 246. Selective Radiation from Various Substances 111, by W. W. Coblentz, Reprint, No. 156, Bureau of Standards.

Rock Salt, Page 690 the New Spectrum, by S. P. Langley, Smithsonian Institute Report (1301)

Flourite, Page 628, Radiometric Investigations W. W. Coblentz Reprint No. 168, Bureau of Standards.

Rock Salt, (infra red rays) Page 194 Light Visible & Invisible, by Silvanus P. Thompson, Published by McMillan & Co., London.

Flourite & Rock Salt (infra red work) Page 56. "The Sun", by Chas. G. Abbott, Published by D. Appleton & Co., New York.

Rock Salt Lenses & Prisms are supplied by such concerns as:

Adam Hilger, Ltd. 75a Camden Road, London, N. W.

Ferdinand Ernecke, Koniggratzerstrasse 112, Berlin, S. W.

Bernhard Hallenachf, Optical Works, Berlin.

Authority for the use of Silver, etc. page 472, Reprint No. 45.

He further states that the emulsion employed for the sound record is composed of gelatine with which is mixed the medium for cutting off the infra red rays, which medium may be very finely divided metallic silver, speculum metal, or any other suitable material designed to intercept such rays. He sensitizes the gelatine coating by means of a solution of bichromate of potassium or a solution of bichromate of ammonium, and the film is treated in the same manner as by the well known raised gelatine process.

It appears to attorneys that applicant has furnished full evidence of the practicability of his invention and they fail to see how he can give a more definite citation of authorities than that contained in this paper and in the last filed amendment. In any event it is quite certain that applicant has made earnest effort to comply with the Examiner's requirement for citation of authorities and if after considering the authorities cited the Examiner still doubts the practicability of the invention his doubts should be resolved in favor of the applicant.

As concerns the requirement for division it may be stated that under the Ruling in Ex Parte King 190 O. G. 548 applicant elects to prosecute in this case claims 1 to 7, inclusive, claim 9, claims 11 to 13, inclusive, and claim 22 and it is therefore requested that action on the merits be given these claims. In his official letter of July 21, 1911 the Examiner stated concerning the requirement for division therein made that his position might be changed upon examination of the authorities requested and apparently therefore it is not incumbrant upon applicant to at this time respond to a requirement for division between the claims which he has above elected to prosecute in the application. In this connection it may be stated, however, that attorneys fail to see how the applicant's negative films could be produced except, and particularly as concerns the sound record, by the recording photographically of the visible light rays variations upon the sensitized film. All of the instruments described by client in his specification are well known and consideration of practically any advanced works on physics will show that it is possible to photographically record sound rays by the variations in intensity of light rays. As the sound record described by applicant could not be produced by any other method it is evident that all of the claims elected to be prosecuted in this case should receive action on the merits.

Respectfully submitted,

Attys. for Craig.

Div. 7. Room. 312

Address only
The Commissioner of Patents,
Washington, D. C.,
and not any official by name.

2-280

Paper No. 8

Address communications respecting this application only, and cause should give the serial number, date of filing, title of invention, and name of the applicant.

DEPARTMENT OF THE INTERIOR

UNITED STATES PATENT OFFICE

WASHINGTON

Feb. 17, 1916.

R. S. & A. B. Lacey,

Washington, D. C.

Enclosed find below a communication from the EXAMINER in charge of the application of

R. M. Craig, filed May 6, 1913, Photographic Attachment for Moving Picture Machines, Serial No. 765,959.

Commissioner of Patents.

Case taken up as amended Feb. 17, 1916.

In response to the examiner's request for more definite authority, applicant has not rendered any assistance whatever, as far as the first group of publications is concerned, in searching out those particular passages upon which he might rely. Of the last group of works cited, that by Thompson is the only one available to the examiner; but the examiner fails to find substantiation for applicant's theory in that part of Thompson referred to. The book was also cited in the last office letter. Applicant will be required to provide the Examiner with transcripts of those parts of the works cited by him, or at least some of them, upon which he specifically relies for his authority on the several points raised by the examiner; and in the meantime the examiner will endeavor to obtain copies of these publications.

The examiner still fails to see how applicant's device can be made to operate successfully, but on the other hand is of the opinion that it will not work, for reasons stated in previous office letters. The claims are therefore rejected as

covering an inoperative device.

Upon reconsideration claims 8, 10, 20, and 21 may be treated with the claims for finished film. Likewise claims 12 and 13.

Claim 1 is also rejected on Haines, of record, there being no invention in placing the two records on opposite sides of the strip. It is observed that this claim does not state that the records are in overlapping relation.

Claims 2, 3, 5, 6, 8, 11, 15 and 16 are also rejected the same as claim 1, in view of the disclosure by Wood in Scientific American, of record.

Claims 12 and 13 are rejected on Haines and the Scientific American disclosure; the steps here recited not involving any invention but being a very obvious manner of procedure. The real invention in these claims is thought to reside in the finished film; the so-called "method" merely stating an obvious way of constructing applicant's combination film. These claims are therefore rejected on this ground also. Ex parte Trevetts 97 O. G. 1173.

The rejection of claims 14 and 17 is repeated.

Claim 17, in substance, is also rejected the same as claims 2, 3, &c., attention being called to the fact that the two records are not superposed. This is recognized as being the gist of applicant's invention, and unless this is brought out, there is no purpose in employing the particular forms of records.

Claim 18 is rejected the same as claim 1.

Claim 19 is indefinite in the word "opposed". This "opposed" arrangement would seem to require a particular form of deposit for each of the records; and this should be stated. Likewise claim 20.

In claim 21, line 3, "visible end" should be canceled.

JRW.

L. D. Underwood

Examiner.

U. S. Patent Office
FEB 3 1917
DIVISION VII

S/MOD Feb. 2, 1917. 5086-T

IN THE UNITED STATES PATENT OFFICE.

Richard W. Craig, Serial No. 765,959,

Phonographic Attachments for Moving Picture Machines,

Filed May 6, 1913, Room No. 312

Hon. Commissioner of Patents,

SIR:

In response to official action of Feb. 17, 1915, amendment is hereby made as follows:

Cancel claims 12 and 13 and renumber the remaining claims consecutively.

Claim 1, line 2, erase "pictures" and insert --picture records--

Last line, change the period to a comma and add --the records being in overlapped relation --

Make the same amendments to claims 2, 3 and 5.

Claim 6, last line, change the period to a comma and add --the records being in overlapped relation--

Claim 8, line 2, erase "substance" and insert --medium--

Change the period at the end of the claim to a comma and add --the mediums being in overlapped relation--

Claim 11, last line, change the period to a comma and add --the records being in overlapped relation--

In each of claims 13 and 14, change the period to a comma and add --the records being in overlapped relation--

Claim 15, line 5, after "of" (first occurrence) insert --superposed--

Claim 16, last line, change the period to a comma and

and --the records being overlapped--

Claim 17, line 2, after "and" insert --transparent--

Claim 17, line 3, erase "visible and"

In his present action the Examiner insists upon applicant furnishing extracts or transcripts from the authorities upon which he relies to support his theories. In effect, the Examiner is requiring the applicant to cite references to show that his invention is old. Applicant does not know of any published work which discloses his theory in its entirety. The applicant's invention is the result of the collateral reading of the authorities to which he has previously referred and of independent inventive reasoning on his part. The sensitiveness of a selenium cell to invisible light rays is well known; the fact that finely divided silver will intercept invisible light rays is also well known, and so with all of the other propositions advanced by applicant in setting forth the principles of his invention.

It is thought that claims 1, 2, 3, 5, 6, 9, 11, 13, 14, 15, 16 and also claim 19, as amended to set forth the overlapped relation of the sound and picture records, distinguish from the references cited against them.

A careful reconsideration of claims 12 and 15 is respectfully requested. These claims are thought to be proper claims and to set forth more than a mere obvious use of the film.

Claim 17 has been amended to set forth the fact that the photographonic record is transparent and is therefore not open to the objection noted. It is not thought necessary to define the character of the picture and sound records in claim 18 as this claim is drawn to the sensitized film and the coatings upon which these records are to be made need not in their initial condition be transparent any more so than an ordinary photographic film before exposure.

It is thought that the Examinershould waive his objection on the ground of imperativeness and should allow the claims as they now stand.

Respectfully submitted,

Atty. for Craig.

Letter to Office

U. S. Patent Office
FEB 19 1917
DIVISION VII

S/TDT eb. 16, 1917. 5086-T

IN THE UNITED STATES PATENT OFFICE.

Richard W. Craig, Ser. No. 765,959,

Phonographic Attachments for Moving Picture Machines,

Filed May 6, 1913, Room No. 312.

Hon. Commissioner of Patents,

S I R:

Supplemental to amendment of Feb. 2. 1917. Attorneys wish to quote below from a letter just received from applicant and request that this matter be carefully considered in connection with the said amendment.

"I am sorry the Examiner is skeptical. I am absolutely positive of my apparatus. I experimented for a good deal over a year and built a great many testing instruments and apparatus to arrive at my results and conclusions. It is not guess work on my part or a "wildcat" dream. Much of my data, which lead to my ultimate results was obtained first handed by personal correspondence with some of the leading scientists in the United States, each being an authority in his line. One was W. W. Coblents of the Bureau of Standards. Another was Chas. G. Abbott, of the Astrophysical Observatory, one of the most noted living authorities on Infra-red Rays. I might mention numbers of others. Though some of my apparatus was a bit crude, account of the crudeness of my facilities, the results were sufficiently satisfactory and convincing to myself to at once apply for a patent.

It seems as though the principle objection raised is the sound record will obstruct the passage of the visible rays through the picture record. The sound record will not obstruct the passage of the picture record, this I am absolutely positive of. It is put on with gelatine which is transparent and the silver is merely a trace and of such finely divided particles as to be thoroughly transparent. They are held in the gelatine medium (Besides silver there are a number of other things that can be used that are transparent of themselves, and which intercept the passage of infra red rays, but not so well as the silver and which is really transparent if used properly.) It must be remembered the Bolometer (reproducer) can under certain conditions be made so sensitive that it will register accurately heat down to the hundredth millionth part of a degree

(S. P. Langley's method), which is virtually a million times more sensitive than is necessary in my case, and although the silver is but a trace, it is sufficient to interrupt the passage of the infra-red rays to such an extent as to set up a very considerable disturbance in the bolometer and thus ultimately through the bolometer in the reproducing apparatus. (I might mention I used both a bolometer and a tasimeter in my test work). I might in a rough way use an example I am actually using now in the adv. device am developing now (I have one right here in the room now) which is a transparent mirror. It is set in the face of the machine and when the machine is dark on the inside it is a perfect mirror, but the instant the light is turned on inside the machine it is perfectly transparent and the advertisement and the colors etc immediately appear very distinctly right through the mirror. I merely mention this to show that even this silver is transparent and yet this coating is infinitely heavier than is necessary on my film. I might mention another patent already issued to Hoffman in which silver is used in an electric light globe to reflect back the infra-red rays which excludes the heat and at the same time uses the heat for intensifying the glow of the filament (Patent No. 1,043,008), and yet not cut off the white light. In one form of photography a slightly silvered lens is used for screening off certain rays. There are a number of varieties of glasses out on the market now for use in oxy-acetelene welding and the like in which glasses are worn by the workman for screening off the infra-red rays and some of which are entirely transparent and clear. I have made quite a little study of the subject of invisible lights, getting all the works obtainable on the subject, even getting some from England and Germany, have read papers etc before scientific societies etc. Though I make no pretenses of being an authority on the subject, still I feel I know my subject sufficiently well, and with the knowledge of the actual scientific principles involved, together with actual experimental work performed, to know whereof I speak. My conclusions are the results of numerous actual experiments. I probably used over 100 likely chemicals in looking for a medium suitable for my film, before I determined the gelatine-silver medium was one of the best. This was after every other detail was completed."

Respectfully submitted,

R. V. D. Harkness

Attys. for Craig.

1071

...7 ... Room ... 312
Address only
"The Commissioner of Patents,
Washington, D. C.,"
and not any official by name.

2-200

No. Paper No. 10
All communications respecting this application should give the serial number, date of filing, title of invention, and name of the applicant.

DEPARTMENT OF THE INTERIOR
UNITED STATES PATENT OFFICE
WASHINGTON April 13, 1917.

R. S. & A. B. Lacey,
Washington, D. C.

PATENT OFFICE
APR 18 1917
MAILED

Please find below a communication from the ***EXAMINER*** *in charge of the application of*

R. M. Craig, filed May 6, 1913, Phonographic Attachment for Moving Picture Machines, Serial No. 765,959.

Thomas Ewing
Commissioner of Patents.

Case reconsidered as amended Feb. 2, 1917, and in connection with communication of Feb. 17, 1917.

The examiner has carefully considered applicant's last argument, and has also availed himself of an opportunity to observe the effect of a thin metallic silver coating on visible light rays. As a result, the examiner feels satisfied that the sound record formed of such a deposit on one side of the film would make practically impossible the reproduction of the pictures on the other side of the film for the reason that too small a part of the visible rays would be transmitted by the sound record deposit. It was the observation of the examiner that only violet, and apparently only a part of these rays, could be seen through the metallic silver coating; and it is thought to be clear that a satisfactory reproduction of the picture record would be practically impossible with such a small part of the visible rays. Applicant's device must therefore be held to possess no practical utility; wherefore all the claims are rejected.

Attention is again called to the arguments advanced by the examiner in the previous office letters as to the deposits

on the two sides of the film and their effect upon the passage of light rays.

As far as can be learned by the examiner through further investigation, a selenium cell is, practically speaking, sensitive to only the visible light rays. In view of which fact the selenium cell in applicant's device would not respond to the infra-red rays to such an extent as is necessary in order to reproduce the sound record. For which reason the device is held to be inoperative, and all the claims are accordingly rejected.

The rejection of claim 18 on Haines et al., of record, is repeated.

Claims 19 and 20 are still held not to fully state the invention for the reason given in the last office letter, foot of page 2; whereforethese claims are rejected.

This application has been made special in accordance with Commissioner's Order No. 2210; and applicant's response to the above official action should be prompt and place the case in condition for final action by the examiner.

JEM.

L. D. Underwood

Examiner.

AUG 15 1917

S/MOD August 14, 1917. 5086-T ✓

IN THE UNITED STATES PATENT OFFICE.

Richard W. Craig, Serial No. 765,959,

Phonographic Attachments for Moving Picture Machines,

Filed May 6, 1915, Room No. 512.

U. S. Patent Office
AUG 16 1917

Hon. Commissioner of Patents,

S I R:

In response to official action of April 18, 1917,

At a recent interview had with the Examiner in the matter of the above-entitled case, authorities were submitted showing that the grounds for rejection stated in the official action of April 18, 1917 are untenable.

At the interview the conclusion was also reached that claim 18 was patentable over Haines, of record, as Haines does not show the picture and sound records upon "opposing surfaces" of the film. It was also agreed at the interview that claims 19 and 20 properly stated the invention.

It is respectfully requested that the case be passed to issue.

Respectfully submitted,

R. F. & C. W. Lacey

Attys. for Craig.

[Seventh Edition.]

No 18,057 A.D. 1906

Date of Application, 11th Aug., 1906.

Complete Specification Left, 11th Feb., 1907—Accepted, 10th Aug., 1907.

PROVISIONAL SPECIFICATION.

A New or Improved Method of and Means for Simultaneously Recording and Reproducing Movements and Sounds.

We, ROBERT THORN HAINES, Scientific Expert, of 26, Osnaburgh Street, Regents Park, London, JOHN ST. VINCENT PLETTS, Electrical Engineer, of "Ivanhoe", Clarence Road, Teddington, Middlesex, and EUGENE AUGUSTIN LAUSTE, Electrical Engineer, of 64, Strand, London, do hereby declare the nature of this invention to be as follows:—

This invention relates to a new or improved cinematographic and phonographic method or process and to means for recording and reproducing simultaneously the movements or motions of persons or objects and the sounds produced by them.

The object of the invention is to provide an effective method of, and means for, recording the simultaneous movements or motions of persons or objects and the sounds produced by them, so that the impressions of the movements will be recorded simultaneously with the impression of the sound waves, and will be reproduced simultaneously and in exact synchronism with them, and so that the sound waves will not suffer any variation or modification in the process of recording and reproducing, but when reproduced will be similar in every respect to the original sound waves and will therefore reproduce precisely the same sounds.

It is essential to the correct reproduction of the movements of the persons or objects in combination with the sound waves, that the simultaneous movements and sounds should be recorded and reproduced simultaneously in exact synchronism, and that the sound-waves which constitute the sounds should not suffer any variation, alteration, or modification, in the process of recording and reproducing, but should be recorded and reproduced alone and without the introduction or accompaniment of any other sound waves.

It is obvious therefore that no true record or reproduction of the sound waves could be made by any mechanical process or means in which a hard substance necessary to make the impression comes in contact with another hard substance, such for instance as the recording or reproducing pin of the phonograph or gramophone, because the friction caused between the two hard substances itself creates vibration or sound waves which accompany, vary, or modify, the sound waves which it is desired to record and reproduce, and are recorded and reproduced with the latter, proving detrimental to their true reproduction. The record therefore must be taken or produced without any contact between the medium caused to vibrate by the sound waves and the record or recording substance. It is further obvious that if the impressions of the movements and sounds were recorded separately on separate records or recording substance or material, the movements and sounds would be liable to vary in point of time and fail to synchronize with each other. In order to avoid this liability and ensure correct synchronism, the movements and sounds must be recorded simultaneously on the same record or recording substance or material.

The essential feature of our invention is an arrangement of means for obtaining as perfect a reproduction as possible of the movements of the persons or objects and the sounds simultaneously produced by them.

By our method as hereinafter more particularly described, we transmit the sound waves electrically from the place where the sounds originate to the place where we desire to have them recorded, and we record them photographically in varying degrees as to area, quantity, intensity, and corresponding effect of light and shade, proportioned to their period and amplitude, simultaneously with the recording photographically of the impressions or photographs of the successive movements of the objects, on separate parts, or in separate positions, of one or the same transparent medium or recording substance or material; and when such record is obtained we reproduce it by causing light to pass through that portion of the medium containing the record of the impressions, and so project them on the screen, and simultaneously cause light to pass through that portion of the medium containing the record of the sound-waves, to a cell of selenium or other suitable substance by which the varying degrees of light and shade of the record are converted into corresponding varying electric currents, which are so transmitted to the place where it is desired to reproduce them, and are there converted into vibrations by a suitable vibrating medium which reproduces the sound waves.

For the purpose of carrying out our invention we employ the following essential features in combination, suitable arranged relatively with each other.

1. A receiver or arrangement for collecting or receiving the sound waves to be transmitted.

2. A telephonic or microphonic transmitter to transmit the sound waves in electric circuit with a telephonic or microphonic receiver.

3. A telephonic or microphonic receiver to receive them.

4. A source of light, and a screen operated by the telephonic or microphonic diaphragm so as to vary its intensity or the intensity of the beam of rays emanating from it, or a mirror to alter or vary the direction of the rays of light.

5. A sensitised transparent medium or record for receiving the photographs or impressions of the movements and sounds.

6. A combination of mechanical parts for moving or translating such sensitised transparent medium or record to serve as a camera.

7. A source of light, and arrangement of mechanical parts for moving or translating such sensitised transparent medium or record, to serve as a projector.

8. A cell of selenium, or other suitable material, connected in proper electric circuit with a receiving or reproducing telephone or microphonic instrument, for transforming the light, varied by the varying light and shade of the record into corresponding electric currents, and transmitting them to such receiving or reproducing instrument.

9. A telephonic or microphonic receiving and reproducing instrument to receive the electric currents and convert them into vibrations and again into sound waves.

10. A horn, or spreader, or other arrangement for amplifying or increasing the loudness of the sounds.

There are various different forms and methods of using each of these essentials, which may be conveniently employed, and which we may prefer to substitute for and use in combination with any of the other essentials, and we do not therefore confine ourselves to the particular methods or parts described to be used in combination with any of the other essentials.

We will proceed to described the methods or process, and means for carrying it out, together with various alternative means which may be conveniently employed therewith.

The sound waves as well as the motions or movements of the objects which produce them are necessarily at a considerable distance where the record must be taken, and must also be reproduced at a considerable distance from the record; it is therefore essential to provide a means of receiving the sound waves

and transmitting them to a recording instrument, and a means of transmitting them from the recording instrument and reproducing them at a distant place.

For the purpose of collecting or receiving the sound waves we prefer to use a microphonic receiver such as is at present used for collecting the sound waves at concert or music halls for transmission, or we may use one or more horns or trumpets connected with any ordinary loud sounding telephone or microphone transmitter which receives the sound waves and transmits them to the receiving instrument, or we may prefer to use some other suitable means of collecting the sound waves for transmission.

Whatever form of transmission may be used we connect it in circuit with the receiving instrument, so that the sound waves may be converted into varying electric currents and transmitted from the transmitter to the receiver. These varying electric currents may be made to operate a diaphragm so as to reproduce the sound waves, or may be used to vary the strength of a magnet so as to vary and alter its attractive force.

We provide a suitable source of light or illuminant, and a means of varying its intensity or the intensity of the beam of rays emitted or emanating from it, so that the variations in its intensity or the intensity of the beam of rays, will be exactly proportioned to the variations in the sound waves transmitted by the corresponding electric current.

There are various means of varying the intensity of the source of light or the beam of rays of light, which may be conveniently employed.

We may prefer to use a lamp of great illuminating power having air supplied to it by a pipe which communicates with the diaphragm of the receiving instrument, so that when the diaphragm is caused to vibrate by the electric currents the amplitude and rapidity of the vibrations being proportioned to the sound waves the pulsations of air transmitted to the lamp cause proportional vibrations of the light. A reflector may be used for reflecting or directing the rays of light, and a lens or lenses for concentrating or condensing the light and bringing it to a focus.

We may prefer to vary the beam of rays emanating from the source of light by using a reflecting mirror which is caused to vibrate by the diaphragm or vibrating medium of the receiving instrument and reflects a varying beam of light through a lens or lenses into a dark chamber arranged in a camera; or instead of employing a reflecting surface two gratings may be employed one of which is arranged so as to be operated by the diaphragm or other vibrating medium of the receiving instrument, and so vary the beam of rays of light, allowing it to pass through a lens or lenses into the dark chamber or camera.

Or we may prefer to employ as a means of changing a beam of light or other radiant energy into vibrations corresponding to sound waves sensitive jets of air, gas, water, or other fluid, or we may prefer to use an oscillograph for the purpose, or any other known method of converting variations of current intensity into variations in light intensity, where the quantity or quality of the bundle or rays is controlled according to the variations of the current, may be used.

Whatever particular method or means may be employed by us for varying the light source or the rays of light emanating from it, we direct and control the light so that the variations and its intensity which correspond with the sound waves and the electric currents, will impress themselves photographically upon a sensitised transparent medium so that the impressions so made will proportionately correspond in some particular characteristic or form with the varying intensity of the light, the varying electric currents, and the varying sound waves.

For instance the impressions may be made in varying degrees of opacity and transparency, or light and shade, so as to correspond with the sound waves.

They may take the form of lines or dots of varying widths or sizes or varying distances apart.

1927

Or they may take the form of a varying spiral or varying wave lines, or of an opaque band varying in width so as to vary the proportion of transparency and opacity.

Or any other form which may be desired.

Within the dark chamber or camera a sensitive photographic film wide enough to receive the photographic impressions or movements of the objects and also the impressions of the sound waves, side by side, as arranged to be translated by any suitable mechanism, such as is usually employed for translating the films in an ordinary cinematographic camera.

This film is operated so that one part is translated continuously past a narrow slot or other suitably shaped opening in the chamber opposite the side where the sound waves are to be recorded, and the other part is translated intermittently past the lens as in an ordinary cinematograph camera.

By this means it will be seen that the record of the sound waves will not be exactly opposite the picture of the simultaneous movement, but at a short distance from it, although we may prefer to place the record of the movements and sounds in other positions relative to each other.

The sound waves which are electrically transmitted to the receiver cause corresponding variations in the source, or beam of rays, of the light, which is reflected or otherwise allowed to pass through a lens and through the slot or other shaped opening to the film.

The record of the sound waves thus made on the right or left hand side of the film, and the photographic impression of the motions or movements of the objects is photographed or taken simultaneously on the right or left hand side of it, side by side, so that the first of the sound wave impressions will commence at a convenient distance from the first of the impressions of the motions of movements so as to allow a loop to be made in the film in order that one part may be translated continuously and the other part intermittently.

The record thus taken of the sound waves consists of a continuous series of photographic impressions of light and shade, varying in degrees of transparency and opacity corresponding with the variations and the quantity or quality of intensity of the beam of rays of light reflected or allowed to reach the film, or it may consist of, or be made to take, such other form as may be desired.

Instead of using a strip of transparent sensitive film or medium for receiving the record, a sensitive circular plate of transparent material may be employed and caused to rotate by suitable mechanism and to move or change its position so that a fresh surface is presented to the light at each revolution, and the photographic impressions of the sound waves and motions or movements of the objects will be photographed in the desired positions in series on its surface.

Or the record may be made or photographed on an opaque plate having a polished surface and reflected from it, or reflected from it by a polished surface.

We may prefer to use a transparent cylinder or some other form of record.

For the purpose of reproducing the record thus produced we employ an instrument for translating the film similar in every respect to the former instrument described, but not enclosed in a dark box or chamber.

There are various bodies or substances whose electric conductivity is varied by the rays of light which fall upon them from the sun or other sources of light. Certain substances when exposed to light waves or radiations have the property of presenting a decreasing resistance to the passage of an electric current as the intensity of the radiation increases, and other substances have the property of presenting an increasing resistance to the passage of electricity as the intensity of the radiation increases. We may employ any of the substances, of either of these classes, for the purpose of converting the various degrees of light or shade, which correspond with the sound waves, into varying electric currents, and transmitting them for reproduction at the place required.

Means for Simultaneously Recording and Reproducing Movements and Sounds.

Any variation in the quantity or quality of the intensity of the radiant energy falling upon them alters their conductivity or resistance.

We prefer to use selenium prepared in a cell so as to become most sensitive to the light rays, or have its electrical resistance or conductivity altered or varied to the greatest extent by the light falling upon it.

This cell is arranged in circuit with a loud sounding microphone or telephone employing a suitable source of electric current, or it may be arranged in circuit with an electric lamp used in conjunction with a horn or trumpet for amplifying the sounds; or we may prefer to use a diaphragm which will vibrate and effect changes in a gas, oil, or other flame, connected with a horn or trumpet for amplifying the sounds, or we may employ any other suitable means of reproducing the electrical variations produced in the current through the selenium cell.

To reproduce the sound waves and impressions of the motions or movements of the objects, the film or record is placed in proper position in the reproducing instrument with a suitable source of light placed behind it so that the light will project the pictures on the screen and at the same time it or another light is placed so as to pass through the portion of the film containing the record or photographic impressions of the sound waves, and also through a lens if desired which may be interposed between the lens and the selenium cell for concentrating the rays which pass through the film and on to the selenium cell. When the film is translated at the proper speed the pictures will be projected upon the screen by the projecting lens of the instrument, and simultaneously the light passing through the film will be caused to vary in quantity, quality, or intensity, by the varying degrees of opacity and transparency or other forms or conditions of the photographic impressions on the film. Such variations in the quantity and quality of the intensity of light will correspondingly vary the electrical conductivity or resistance in the selenium and transmit the corresponding varying current which will produce corresponding vibrations or variations in the diaphragm or alterations in the flame or gas employed, so producing vibrations which produce the original sounds.

The sounds may be used to cause variations in light and in a cell of selenium or other substance used to transmit the sound waves in electric currents to the receiver.

Any of the means of varying the light source or rays emanating from it as described for the recording purpose, may also be used for varying the light for the purposes of transmission.

It is obvious that any suitable form of cinematograph mechanism may be used for translating the film, and that any desired arrangement of the pictures and record of the sound waves on the film or other medium may be used.

Instead of a microphone, where varying musical or other sounds have to be collected from a stage or the like and transmitted to the camera where they are used to affect the light in the manner described a number of conical or other chambers may be arranged in suitable positions having their outer open ends enclosed by india rubber or other suitable material tubes leading from the smaller ends of the different chambers converging to one larger tube which transmits the vibrations to the gas or other lamp which is affected by their vibrations in the manner required.

Dated this 10th day of August, 1906.

EDWARDS AND CO.,
Chartered Patent Agents,
Chancery Lane Station Chambers, London,
Agents for the Applicants.

COMPLETE SPECIFICATION.

A New or Improved Method of and Means for Simultaneously Recording Reproducing Movements and Sounds.

We, ROBERT THORN HAINES, Scientific Expert, of 26, Osnaburgh Street, Regents Park, London, JOHN ST. VINCENT PLETTS, Electrical Engineer, of "Ivanhoe", Clarence Road, Teddington, Middlesex, and EUGENE AUGUSTIN LAUSTE, Electrical Engineer, of 46, Strand, London, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement and accompanying drawings.

This invention relates to a new or improved cinematographic and phonographic method or process and to means for recording and reproducing simultaneously the movements or motions of persons or objects and the sound produced by them.

Hitherto it has been proposed to simultaneously record and reproduce animated scenes and sounds by means of combining photographic and phonographic apparatus, but without success owing to the difficulty of ensuring perfect synchronism, and the object of the invention is to provide an effective method of, and means for recording the simultaneous movements or motions of persons or objects and the sounds produced by them, so that the impressions of the movements will be recorded simultaneously with the impression of the sound waves, and will be reproduced simultaneously and in exact synchronism with them, and so that the sound waves will not suffer any variation or modification in the process of recording and reproducing, but when reproduced will be similar in every respect to the original sound waves and will therefore reproduce precisely the same sounds.

It is essential to the correct reproduction of the movements of the persons or objects in combination with the sound waves, that the simultaneous movements and sounds should be recorded and reproduced simultaneously in exact synchronism, and that the sound-waves which constitute the sounds should not suffer any variation, alteration, or modification, in the process of recording and reproducing, but should be recorded and reproduced alone and without the introduction or accompaniment of any other sound waves.

It is obvious therefore that no true record or reproduction of the sound waves could be made by any mechanical process or means in which a hard substance necessary to make the impression comes in contact with another hard substance, such for instance as the recording or reproducing pin of the phonograph or gramophone, because the friction caused between the two hard substances itself creates vibration or sound waves which accompany, vary, or modify the sound waves which it is desired to record and reproduce, and are recorded and reproduced with the latter, proving detrimental to their true reproduction. The record therefore must be taken or produced without any contact between the medium caused to vibrate by the sound waves and the record or recording substance. It is further obvious that if the impressions of the movements and sound were recorded separately on separate records or recording substance or material, the movements and sounds would be liable to vary in point of time and fail to synchronize with each other. In order to avoid this liability and ensure correct synchronism, the movements and sounds must be recorded simultaneously on the same record or recording substance or material.

The essential feature of our invention is an arrangement or means for obtain-

ing as perfect synchronous reproduction as possible of the movements of the persons or objects as well as the sounds simultaneously produced by them.

By our method as hereinafter more particularly described we transmit the sound waves electrically from the place where the sounds originate to the place where we desire to have them recorded, and we record them photographically in varying degrees as to area, quantity, intensity, and corresponding effect of light and shade proportioned to their period and amplitude, simultaneously with the recording photographically of the impressions or photographs of the successive movements of the objects, on separate parts, or in separate positions, of one or the same transparent medium or recording substance or material; and when such record is obtained we reproduce it by causing light to pass through that portion of the medium containing the record of the impressions, and so project them on the screen, and simultaneously cause light to pass through that portion of the medium containing the record of the sound-waves, to a cell of selenium or other suitable substance by which the varying degrees of light and shade of the record are converted into corresponding varying electric currents, which are so transmitted to the place where it is desired to reproduce them, and are there converted into vibrations by a suitable vibrating medium which reproduces the sound waves.

For the purpose of carrying out our invention we employ the following essential features in combination, suitably arranged relatively with each other.

1. A receiver or arrangement for collecting or receiving the sound waves to be transmitted

2. A telephonic or microphonic transmitter to transmit the sound waves in electric circuit with a suitable telephonic receiver.

3. A telephonic receiver to receive them.

4. A source of light and a screen operated by the telephonic diaphragm so as to vary its intensity or the intensity of the beam of rays emanating from it, or a mirror to alter or vary the direction of the rays of light.

5. A sensitised transparent medium or record for receiving the photographs or impressions of the movements and sounds.

6. A combination of mechanical parts for moving or translating such sensitised transparent medium or record, to serve as a camera.

7. A source of light, and arrangement of mechanical parts for moving or translating such sensitised transparent medium or record, to serve as a projector.

8. A cell of selenium or other suitable material connected in proper electric circuit with a receiving or reproducing telephone instrument, for transforming the light, varied by the varying light and shade of the record into corresponding electric currents, and transmitting them to such receiving or reproducing instrument.

9. A telephonic receiving and reproducing instrument to receive the electric currents and convert into vibrations and again into sound waves.

10. A horn, or spreader or other arrangement for amplifying or increasing the loudness of the sounds

There are various different forms and methods of using each of these essentials, which may be conveniently employed, and which we may prefer to substitute for and use in combination with any of the other essentials and we do not therefore confine ourselves to the particular methods or parts described to be used in combination with any of the other essentials.

We will proceed to describe the method or process and means for carrying it out, together with various alternative means which may be conveniently employed therewith.

The accompanying drawings are in illustration of our invention. Figure 1 being a sectional elevation shewing an arrangement of apparatus for collect-

ing or receiving the sound waves to be transmitted and a transmitter to transmit the sound waves in electric circuit with the receiver

Figures 2, 3, and 4, shew parts of the apparatus on a larger scale and hereinafter more particularly described.

Figure 5 is a part sectional elevation of the reproducing apparatus.

The sound waves as well as the motions or movements of the objects which produce them are necessarily at a considerable distance from where the record must be taken, and must also be reproduced at a considerable distance from the record; it is therefore essential to provide a means of receiving the sound waves and transmitting them to a recording instrument, and a means of transmitting them from the recording instrument and reproducing them at a distant place.

For the purpose of collecting or receiving the sound waves we prefer to use a microphonic transmitter such as at present used for collecting the sound waves at concert or music halls for transmission, or we may use one or more horns or trumpets *a* connected with any ordinary loud sounding telephone or microphone transmitter *b* which receives the sound waves and transmits them to the receiving instrument.

Whatever form of transmitter may be used we connect it in circuit (*c*, *d*) with the receiving instrument A.

In the drawings we have shewn a magnet B connected with the terminals K, K^1, the varying electric currents from the transmitter *b* operating a diaphragm C^1 having openings D^1 and arranged to more or less uncover openings D in a corresponding fixed diaphragm C. This arrangement is clearly shewn in Figures 3 and 4 in which B is the magnet, D^2 a spring contact carrying the movable diaphragm C^1 operated by the varying strength of the magnet by the varying currents through the terminals from the conducting wires B^1 B^2; F is a light guard through which the light from a light source *j* (Figure 1) is directed. *k* is a reflector contained in a dark chamber *l*. G is a glass or mica screen through which the light passes to the diaphragm. It will be seen that in exactly the same proportion of variation in the attractive force of the magnet due to the variation in the electric currents so the amount and intensity of the light permitted to pass through the vibrating diaphragm will vary. This diaphragm and its openings can be adjusted more or less by the screw E.

There are various means of varying the intensity of the source of light or the beam of rays of light, which may be conveniently employed.

We may prefer to use a lamp of great illuminating power having air supplied to it by a pipe which communicates with the diaphragm of the receiving instrument, so that when the diaphragm is caused to vibrate by the electric currents the amplitude and rapidity of the vibrations being proportioned to the sound waves the pulsations of air transmitted to the lamp cause proportional vibrations of the light. A reflector may be used for reflecting or directing the rays of light, and a lens or lenses for concentrating or condensing the light and bringing it to a focus.

We may prefer to vary the beam of rays emanating from the source of light by using a reflecting mirror which is caused to vibrate by the diaphragm or vibrating medium of the receiving instrument and reflects a varying beam of light through a lens or lenses into a dark chamber arranged as a camera.

Or we may prefer to employ as a means of changing a beam of light or other radiant energy into vibrations corresponding to sound waves sensitive jets of air, gas, water or other fluid, or we may prefer to use an oscillograph for the purpose, or any other known method of converting variations of current intensity into variations in light intensity, where the quantity or quality of the bundle of rays is controlled according to the variations of the current, may be used.

Whatever particular method or means may be employed by us for varying the light source or the rays of light emanating from it, we direct and control the light so that the variations and its intensity which correspond with the sound waves and the electric currents, will impress themselves photographically upon a sensitised transparent medium so that the impressions so made will proportionately correspond in some particular characteristic or form with the varying intensity of the light, the varying electric currents, and the varying sound waves.

For instance the impressions may be made in varying degrees of opacity and transparency or light and shade, so as to correspond with the sound waves.

They may take the form of lines or dots of varying width or sizes or varying distances apart.

Or they may take the form of a varying spiral or varying wave lines, or of an opaque band varying in width so as to vary the proportion of transparency and opacity, or any other form which may be desired.

Within the dark chamber or camera a sensitive photographic film *m* (Figure 1) wide enough to receive the photographic impressions of movements of the objects and also the impressions of the sound waves, side by side, is arranged to be translated by any suitable mechanism m^1 such as is usually employed for translating the films in an ordinary cinematographic camera.

This film is operated so that one part is translated continuously past a narrow slot or other suitable shaped opening in the chamber opposite the side where the sound waves are to be recorded, and the other part is translated intermittently past the lens *n* as in an ordinary cinematograph camera.

By this means it will be seen that the record of the sound waves will not be exactly opposite the picture of the simultaneous movement but at a short distance from it, although we may prefer to place the record of the movements and sounds in other positions relative to each other.

The record of the sound waves thus made on the right or left hand side of the film, and the photographic impressions of the motions or movements of the objects is photographed or taken simultaneously on the right or left hand side of it, side by side, so that the first of the sound wave impressions will commence at a convenient distance from the first of the impressions of the motions or movements so as to allow a loop to be made in the film (as shewn in Figure 1) in order that one part may be translated continuously and the other part intermittently.

In Figure 2 *o* indicates the sound waves upon the film and o^1 the photographic impressions.

The record thus taken of the sound waves consists of a continuous series of photographic impressions of light and shade varying in degrees of transparency and opacity corresponding with the variations and the quantity or quality of intensity of the beam of rays of light reflected or allowed to reach the film, or it may consist of, or be made to take, such other form as may be desired.

Instead of using a strip of transparent sensitive film or medium for receiving the record, a sensitive circular plate of transparent material may be employed and caused to rotate by suitable mechanism and to move or change its position so that a fresh surface is presented to the light at each revolution, and the photographic impressions of the sound waves and motions or movements of the objects will be photographed in the desired positions in series on its surface. L, L^1 are terminals to which an ordinary telephone attachment is connected so that facility of inspection as to working correctly is insured.

Or the record may be made or photographed on an opaque plate having a polished surface and reflected from it, or reflected from it by a polished surface.

We may prefer to use a transparent cylinder or some other form of record.

For the purpose of reproducing the record thus produced we employ an

instrument for translating the film similar in every respect to the former instrument described, but not enclosed in a dark box or chamber.

These are various bodies or substances whose electric conductivity is varied by the rays of light which fall upon them from the sun or other sources of light. Certain substances when exposed to light waves or radiations have the property of presenting a decreasing resistance to the passage of an electric current as the intensity of the radiation increases, and other substances have the property of presenting an increasing resistance to the passage of electricity as the intensity of the radiation increases. We may employ any of the substances of either of these classes, for the purpose of converting the various degrees of light or shade, which correspond with the sound waves, into varying electric currents, and transmitting them for reproduction at the place required.

Any variation in the quantity or quality of the intensity of the radiant energy falling upon them alters their conductivity or resistance.

We prefer to use selenium prepared in a cell so as to become most sensitive to the light rays, or have its electrical resistance or conductivity altered or varied to the greatest extent by the light falling upon it.

This cell is arranged in circuit with a loud sounding microphone or telephone H (Figure 5) having a suitable source of electric current M, and fitted with a horn or trumpet for amplifying the sounds. Or we may prefer to use a diaphragm which will vibrate and effect changes in a gas, oil or other flame, connected with a horn or trumpet for amplifying the sounds, or we may employ any other suitable means of reproducing the electrical variations produced in the current through the selenium cell.

To reproduce the sound waves and impressions of the motions or movements of the objects, the film *m* or record is placed in proper position in the reproducing instrument with a suitable source of light *p* placed behind it so that the light will project the pictures on the screen and at the same time another light p^1 is placed so as to pass through the portion of the film containing the record or photographic impressions of the sound waves, and also through a lens *q* if desired, which may be interposed between the light and the selenium cell *r* for concentrating the rays which pass through the film and on to the selenium cell. *s* is a heat absorber placed between the selenium cell and the film. When the film is translated at the proper speed the pictures will be projected upon the screen by the projecting lens *l* of the instrument, and simultaneously the light passing through the film will be caused to vary in quantity, quality, or intensity, by the varying degrees of opacity and transparency or other forms or conditions of the photographic impressions on the film. Such variations in the quantity and quality of the intensity of light will correspondingly vary the electrical conductivity or resistance in the selenium and transmit the corresponding varying current through the terminals *u*, u^1 which will produce corresponding vibrations or variations in the microphone H so producing vibrations which produce the original sounds.

The sounds may be used to cause variations in light and in a cell of selenium or other substance used to transmit the sound waves in electric currents to the receiver.

Any of the means of varying the light source or rays emanating from it as described for the recording purpose, may also be used for varying the light for the purposes of reproduction.

It is obvious that any suitable form of cinematograph mechanism may be used for translating the film, and that any desired arrangement of the pictures and record of the sound waves on the film or other medium may be used.

Instead of a microphone, where varying musical or other sounds have to be collected from a stage or the like and transmitted to the camera where they

are used to effect the light in the manner described a number of conical or other chambers may be arranged in suitable positions having their outer open ends closed by india rubber or other suitable vibrating material and having tubes leading from the smaller ends of the different chambers converging to one larger tube which transmits the vibrations to the gas or other lamp which is affected by their vibrations in the manner required.

We are aware that it is not broadly new in apparatus for recording and reproducing the sounds produced by the human voice or otherwise to employ a beam of light directed through a vibrating opaque screen containing a number of narrow slits and arranged parallel with a similarly slotted fixed screen on to a sensitive film mounted upon a transparent medium such as glass or a travelling sensitive strip for photographically recording such sounds. These photographic impressions being subsequently developed and fixed are reproduced by directing a strong beam of light so as to follow the direction of the photographic record and thence penetrate a receiver of selenium or other substance having the property of varying its conductivity of electricity in proportion to the degree of light to which it is exposed. Also that it has been proposed to arrange such receiver in circuit with a constant source of electricity as well as one or more telephone receivers.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is :—

1. A new or improved method of and means for recording and reproducing simultaneously the movements as well as the sounds produced by existing things or objects, the cinematographic and phonographic operations being synchronously performed, substantially as described.

2. Apparatus for simultaneously recording photographically the movements and sounds produced by existing things or objects, optically reproducing the movements and simultaneously photo-electrically transmitting and reproducing the sounds, substantially as described.

3. In an apparatus of the kind claimed in Claim 2, the employment of selenium or other equivalent substance whose electric conductivity is varied by the intensity of light, substantially as and for the purpose described.

4. In apparatus of the kind claimed in Claim 2, means for varying a source of light substantially as and for the purpose described.

5. In combination in apparatus of the kind hereinbefore referred to, a collector and transmitter for the sounds produced by existing things or objects, means for electrically varying or controlling a source of light, a recording medium, means for translating the recording medium so that it receives photographic impressions of the movements and sounds to be reproduced, means for illuminating and projecting said impressions of movements, means for illuminating the photographic impressions of sounds and converting them into corresponding electric waves, and means for transmitting and reproducing said waves, all arranged and adapted to operate substantially as described.

6. In combination in apparatus of the kind hereinbefore referred to, a receiver of sounds, a transmitter for the collected sounds, an electro-magnet arranged in circuit with said trnasmitter and adapted to operate a slotted screen or mirror so as to vary light rays, a translatable film for collaterally receiving and recording simultaneous movements and sounds, a projector for photographic movement impressions, a source of light and a condenser for condensing its rays, a cell of selenium for converting light rays into electric waves, and a telephonic reproducer for said electric waves, substantially as described and shewn by the accompanying drawings.

7. In apparatus of the kind claimed above, a slotted screen comprising fixed and movable diaphragms having inter-registering openings therein in combina-

tion with an electro-magnet adapted to operate the movable diaphragm, substantially as described in reference to Figures 3 and 4 of the accompanying drawings.

Dated this 11th day of February, 1907.

EDWARDS AND Co.,
Chartered Patent Agents,
Chancery Lane Station Chambers, London,
Agents for the Applicants.

A D 1906 Aug 11 N° 18,057

HAINES & Another's COMPLETE SPECIFICATION.

1 SHEET

7th Edition

[This Drawing is a reproduction of the Original on a reduced scale.]

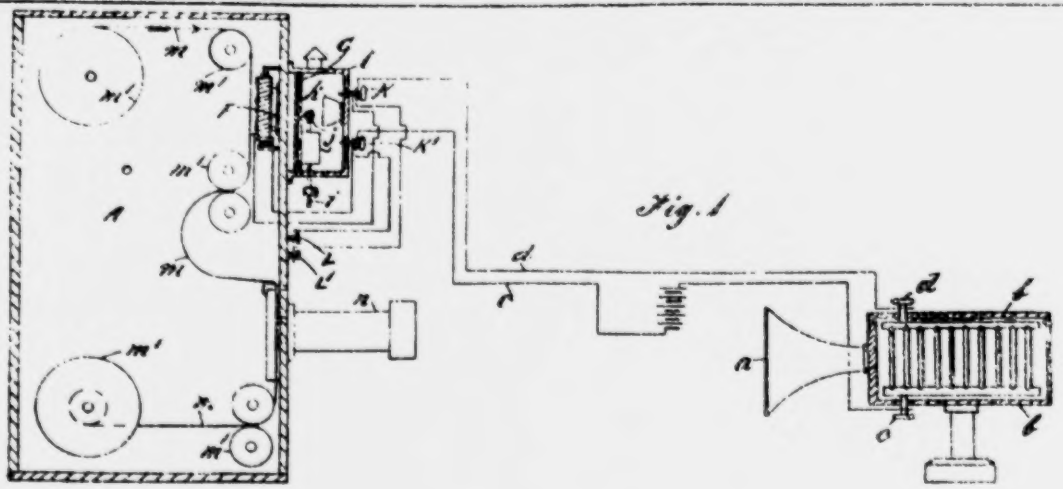


Fig. 1

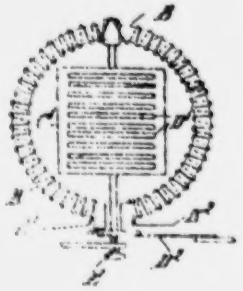


Fig. 3

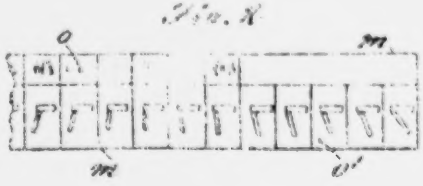


Fig. X

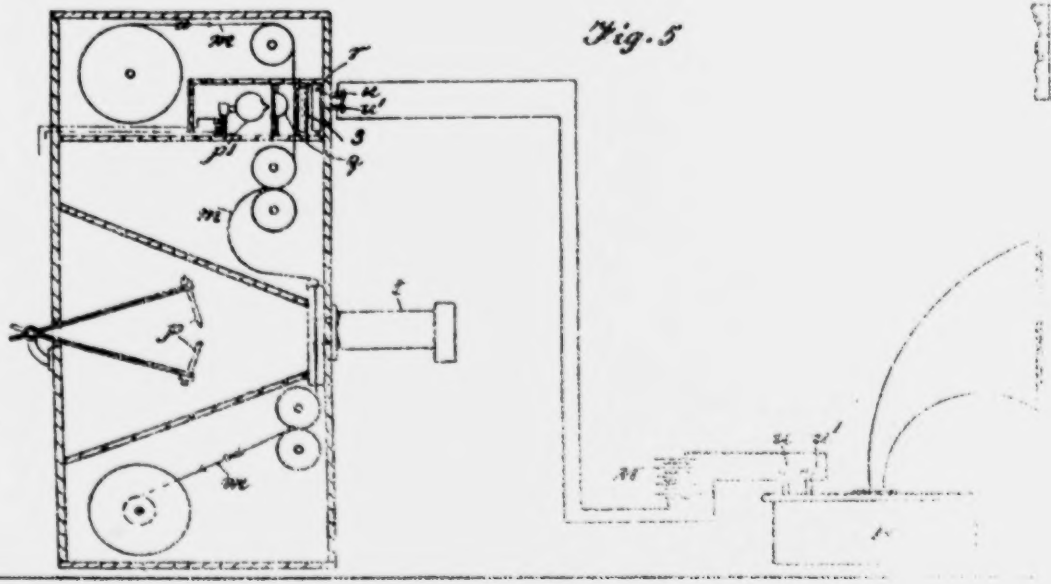


Fig. 5

Fig. 4

Die Idee der Woche:

DER PAPIERFILM

Neuer Versuch auf dem Gebiet der Produktionstechnik

VON FRANK WYSBAR

René Clair sagt in einem Interview einer Tageszeitung über seinen letzten Film „Es leben die Freiheit", daß er selber von diesem Film nach der Fertigstellung nicht in allen Teilen befriedigt gewesen wäre . . . er hätte sich manches vorher anders vorgestellt, als es sich ihm nachher in der Vorführung gezeigt hätte.

Clair rührt mit diesen Feststellungen an ein Problem, mit dem ich mich selbst mit Ihnen auseinandersetzen möchte, indem ich mir — wenn während der Produktionszeit immer wieder die nervenzerrüttende Spannung in den Vordergrund tritt: Wie wird dieser Film nun tatsächlich aussehen und im Ablauf wirken? — die Aufgabe stelle. Einer Dreh- und Regiebuch hinaus eine Konstruktion zu schaffen, die, ohne eine Vorwegnahme des Produktion darzustellen, den gedrehten Film im Ablauf, im Abrollen zeigt.

Tatsache ist, daß wir uns aus Dreh- und Regiebuchlektüre allein kein rechtes Bild machen können, weil unser Hirn einfach nur von einem Drehbuchblatt zum anderen mitliest und mitdenkt und schließlich nur ein ungefähres Eindruck haften bleibt. Tatsache ist ferner, daß in der Produktion die Spannung einsetzt, wie immer dann, wenn man über ein in Arbeit befindliches Produkt „nur ungefähr" Bescheid weiß. Aus diesem „ungefähren Wissen" um das Produkt resultieren Unsicherheit, Nervosität, rotlaufen Hin und Her — die „Schwimmen" ist so von der ersten Regiesitzung bis zur Premiere.

Ich behaupte, daß wir Produzenten uns im allgemeinen viel zu schnell auf einen Stoff festlegen, dem wir garantiert verfallen sind, wenn Finanzierung, Verleihvertrag und Engagements bereits drunhängen: meist geht es Hals über Kopf in die Produktion, weil Termine drängen; die Vorbereitung ist ungenügend — ebenständig und intensiver müssen wir arbeiten, wie in einer Drehzeit von vierzehn Tagen viele hunderttausende Mark an einem unzulänglichen dahinlaufenden Band in ein Produkt investiert werden, von dessen endgültigem Aussehen wir uns in Vorführungsraum immer wieder von neuem überraschen lassen müssen. Der „Schnitt" soll dann retten. Er entsteht so der „zusammengebastelte" Film.

Um diesem Moment völliger Unsicherheit die Spitze abzubrechen und einen hohen Grad von Wahrscheinlichkeit in die Produktionsgestaltung und von Sicherheit in die Produktionsdurchführung einzuführen, habe ich den sogenannten „Papierfilm" konstruiert, der im „Papierfilmatelier" in präziser Vorbereitungsarbeit durch Regisseur, Produktionsleiter, Kameramann und Architekt herbeizuführen sollte.

Zwischen zwei Leitrollen auf denen sich das Papier auf- und abrollt, ist eine breite Schreib- und Zeichenfläche von über 1 m Breite geschaltet, über das in der gleichen Breite das Papier läuft. Auf diesem Papierfilm" wird einstellungsweise mit Dekorationsentwurf, Kameraeinstellung und grundsätzlicher Darstellerbewegung der Film vorinszeniert. Als besonderes Hilfsmittel dienen hierbei die bereits im Modell aufgebauten Dekorationen, diese sind auf einer großen Fläche aufgebaut, die in ihren Größenverhältnissen genau mit denen des Ateliers übereinstimmt. (Das Modellatelier ist also bereits „vollgebaut".)

Ein Elektromotor läßt den Papierfilm, der außerdem noch sämtliche technischen Anweisungen, Zeiten, Längen, Materialverbrauch usw. enthält, langsam vor dem Auge des Regisseurs mit allen geplanten Einstellungen, Blenden und Schnitten abrollen, so daß es möglich ist, hier im Papierfilm-Atelier bereits den ersten Rohschnitt auszuführen. Drehbuchabänderungen vorzunehmen, ganze Szenen umzustellen oder fein nicht zu unterschätzendes Moment) sich zu der Freudigkeit durchzuringen, daß der ganze Film überhaupt nicht gedreht werden darf.

Verbindung mit Trickfilmaufnahmen zur Verbindung wichtiger Szenen und Zusammenschaltung mit Tonaufnahmen auf Nulle-Band oder Daktaphon gestatten weiteren Ausbau des Papierfilms bis zur Projektion auf die Leinwand des Vorführungsraumes.

Ich bin auf viel Kopfschütteln, Skepsis und Ablehnung gestoßen. Nach Besichtigung des ersten Musters aber haben mir Produzenten und Fachleute rückhaltlos ihre Begeisterung darüber ausgesprochen, daß hier ein Weg gefunden scheint, der geeignet ist, eine außerordentliche Ersparnis an Zeit, Material und Drehtagen und außergewöhnliche Erleichterung der Dispositionen zu erreichen.

Noch völliger Fertigstellung des Papierfilms erfolgt sein *Zerschneiden* in die einzelnen Einstellungen, die nach Atelier- und Außenaufnahmen, Synchron- und Stummeinstellungen gruppiert, ein Regiebuch für die praktische Produktionsarbeit abgeben, wie es in solcher Vollständigkeit und Gründlichkeit wohl noch nicht da war. Man hat den Einwand gemacht, daß der Regisseur sich eingeengt fühlen wird, wenn er nach einem solches präzis vorgearbeiteten Plan drehen soll. Ich möchte sagen, daß das Gegenteil erreicht wird: Der Regisseur soll durch vorherige Überwindung des technischen Kleinkrams Zeit und Freiheit gewinnen für die rein künstlerische Gestaltung des Produkts. Das ist am ehesten möglich dann, wenn die Arbeit im Papierfilm-Atelier gewissermaßen die erste Robinsonierung im Kreise der Mitarbeiter gewesen ist, weil auch diese Mitarbeiter jetzt in einer Weise in die Materie und in die Ideengänge des Regisseurs eingeweiht sind, daß eine ganz andere Intensität in der Zusammenarbeit gewährleistet ist als bisher.

Ein deutscher Schulfilm

in Frankfurt gezeigt.

Die Klinger-Oberrealschule hat als erste deutsche Schule (fast ganz Goldmittel) einen Film „O Frankenvolle Jugendzeit!" hergestellt, der es mit vielen vorzüglichen Kulturfilmen aufnehmen kann. Der Film zeigt das Leben und Treiben im Landheim der Schule, das inmitten eines idyllischen Dörfchens der Marburger Gegend liegt, dem nicht gerade ernsten und sorgenvollen Schulbetrieb während der drei Wochen des Lagerlebens und die mannigfaltigen Streiche und Späße der Jungens und der Lehrer.

Der Star des mit humoristischen Titeln vielleicht etwas überladenen Films ist der Kameramann Dinkelbach, ein Lehrer der Schule. Länge des Films 1200 Meter.

Die Debatte um Bolten-Baeckers

Hans Vogt ein „prominenter" Unbeteiligter

Als alles noch auf den stummen Film schwor (1927) war es den Tonfilm nicht nur zu glauben, sondern ihn auch zu verwirklichen. Es verband sich mit Engel a. Mannesfin, sich selbst Erfindung und alle Experimente daran, auf den Tonfilmapparaten zu hören. Wir wissen, es hat dann drei Erfinder gegeben. Am 17. September 1928 wurde in der Akademie in Berlin der erste öffentliche Tonfilm vorgeführt, nach dem gleichen Verfahren, wie es auch heute noch von der Tobis benutzt wird. Wir kennen die Leidensgeschichte dieses Erfindungsprinzips.

In einer Hinsicht bedeutsamen Beschränkung dieses allgemeinen Teils wie zum Beispiel für diesmal perfektionieren, entfernt sich Hans Vogt von heute.

In den gesamten Tonfilm-Prozessen, die bisher liefen und noch laufen (vor allem in Amerika) spielen unter den vielen hundert Patenten vor allem drei Patente eine entscheidende Rolle, als deren persönlicher Urheber ich mich bekennen darf

das Patent Nr. 388 303 vom 14. April 1921, das die gesamte Entwicklung schützt;

das Patent Nr. 397 696 vom 22. Mai 1920, das den gleichmäßigen Lauf des Filmes zum Gegenstand hat; das Patent Nr. 417 217 vom 2. März 1919, das die Photozelle und tragbahnlose Lichtquelle schützt.

Diese Patente führten die Firmen Klangfilm-Tobis beziehungsweise gaben den verbündeten Firmen Magnetophonverfahren. In Amerika besitzt diese Patente (gekauft für 300 000 schw. Franken) William Fox und führt darauf jetzt Prozesse im Werte von vielen hundert Millionen Dollar. Es ist nicht angängig, die erfinderische Arbeit, als deren Ergebnis diese Patente entstanden, und das deutsche Patentamt bezüglich seiner Prüfung zu verurteilen wie es Bolten-Baeckers getan hat. Das Entwicklungspatent ist das Ergebnis einer langen Untersuchungsreihe zur Wahrung der Proportionalität zwischen Negativ und Positiv, das Schwungrad-Patent die Folge eingehender Studien über die Gleichmäßigkeit des Filmdurchlaufes, und im Photozellen- und Glimmlampen-Patent sind diejenigen prinzipiellen physikalischen Vorschläge enthalten, die für tadellose Aufnahme und Wiedergabe von Schallvorgängen auf Filmbändern entscheidend sind.

Ein Erfinder nützt durch seine Leistungen der Allgemeinheit. Seine Erfindungen verdienen einen Schutz, aber es wäre wünschenswert, den Rechtscharakter dieses Schutzes insofern abzuändern, als eine Erfindung von allgemeinem Interesse nicht zu einem Objekt kapitalistischer Spekulationen herabgewürdigt werden dürfte. Die Entwicklung des sprechenden Films innerhalb der Tri-Ergon-Gemeinschaft hat 60 000 RM. gekostet. Dieses Geld zu verzinsen, den Erfindern und Kapitalisten, die die Versuche finanzierten, eine kleine Rente zu gewähren, wäre ein leichtes gewesen und gerecht. Die deutsche Filmindustrie hat sich schnell, schlau und vorteilhaft zusammengefunden, nicht um diese Angelegenheit gebührend Zu Lösen (und Verhandeln) hat sich in den Besitz der Patente gesetzt und ausländische Gesellschaften von rd. 30 bis 40 Millionen Gulden um diesen Komplex herum gegründet. Man mache sich klar, daß die Verzinsung dieser Summen, über deren Verbleib es einmal interessant wäre, Näheres zu hören, in erster Linie die hohen Lizenzen bedingen.

Ton-Bildaufnahmen auf gleichen Filmmaterial

Broesing zur Kopierfrage.

Der klärende Vortrag von Bolten-Baeckers, der das filmpolitische Ereignis dieser Woche war, hat, wie gemeldet, viele Zuschriften an uns erbracht, die von unseren zuständigen Abteilungen noch geprüft werden.

Für heute bringen wir zunächst eine interessante Äußerung von Lignose-Broesing:

Wir lasen mit Interesse die Ausführungen des Herrn Bolten-Baeckers.

Die Darstellung, die Herr Bolten-Baeckers von der Gesamtsituation gibt, bringt zusammenfassend den ja mit langem bereits bekannten Komplex der Fragen um die Patentsituation für das Tonaufnahmeverfahren.

Wie Herr Bolten-Baeckers selbst feststellt, [illegible] ist auch der wirtschaftliche Punkt des Patentes der Tobis.

In der Darstellung des Herrn Bolten-Baeckers möchten wir Ihnen noch einige ergänzende technische Ausführungen zur Verfügung stellen.

Herr Bolten-Baeckers erwähnt, daß er gespannt sei auf die Begründung des Standpunktes „Entwickeln von Bild und Ton-Negativen auf gleichem Rahmen bei gleicher Entwicklungszeit" sei ein getrenntes Verfahren. Bei allen Fehlern in der Praxis vorgekommenen Fällen in denen dieser Punkt streitig war [illegible] Beleuchtungs-Prozeß, hat es sich wie Herr Bolten-Baeckers allerdings nicht näher erläutert am Arbeiten mit verschiedenem Material für Aufnahme von Ton und Bild gehandelt. Ob ein solches Verfahren unter das Entwicklungspatent fällt, sei dahingestellt, doch wurde, wie die gelungenen Proben zeigen, auch seitens der Tobis die Anwendbarkeit des Tobis-Patentes für diesen Fall bezweifelt.

Das Tobis-Patent der getrennten Behandlung kommt jedoch nach Ansicht maßgebender Sachverständiger in Fortfall, sobald man für die Aufnahme das gleiche Material für Bild und Ton verwendet und die Ton- und Bildaufnahmen, wie auch Herr Bolten-Baeckers schon richtig darstellt, im gleichen Entwicklungs- und Kopierverfahren behandelt. Hierdurch wird auch der einzige Einwand daß bei Verwendung verschiedener Emulsionen der Entwicklungsvorgang zum Teil in die Emulsion verlegt und so trotz gleicher Entwicklungsdauer eine verschiedene Entwicklung erzielt wird, entkräftet.

Die Arbeiten, die wir in den letzten Monaten mit unserem Braunschen Rohr Aufzeichnungs-System weitergeführt haben, führten zu dem Ergebnis daß die Lichtempfindlichkeit unseres Apparates für die Tonaufzeichnung eine so große ist (westlaus größer als bei den mit anderen Aufzeichnungsverfahren arbeitenden, zweifellos ausgezeichneten Methoden), daß der Verwendung des gleichen Materials für die Ton- und Bild-Aufnahme nichts mehr im Wege steht.

Wir sind daher der Ueberzeugung, daß der Herstellung von Tonfilmen nach diesem neuen Verfahren das Entwicklungspatent der Tobis nicht entgegensteht.

Wir erwähnen dies, weil wir glauben, daß für die Beurteilung der Gesamtsituation und auch für die Stellungnahme der Produktion zu den schwebenden Fragen der Tonaufnahmeverfahren der vorgenannte Punkt von wesentlicher Bedeutung sein könnte.

Chronik der Uraufführungen 3.

Skandinavien.

1. Januarwoche:

Helsingfors „Timmer Bettaras bröd" („Die Brot des Holzfällers"). Produktion: Suomi Filmi, Helsinki. Regie: Dir. Erkki Karu. Hauptrollen: Helena Koskinen und Urho Somersalmi. Finnisches Volksstück. Wundervolle Naturaufnahmen. Großer Erfolg.

2. Januarwoche.

Stockholm: „Halvvägs till himmelen", („Auf halbem Wege zum Himmel"). Produktion: Paramount-Svenska Avdelning. Mit Edvin Adolfson, Elisabeth Frisk und Karin Swanström.

Helsingfors: „Kaarna och Helina", („Kraniche und Heliaa"). Produktion: O. Y. Suomen Filmi, Helsinki. Regie: Kaarna. Hauptrollen: Tauno Brännäs und Iris Knape-Jaderholm. Lyrisches Volksstück aus dem Leben der Kraniche in Finnlands Grenzgebieten. Viele lustige Volksszenen mit Kranichgesängen.

3. Januarwoche

Stockholm: „Hans liv match". („Der Kampf seines Lebens"). Produktion: A/B Svensk Filmindustri. Regie: Per-Axel Branner. Hauptrollen: Björn Berglund, Birgit Tengroth, Hakon Westergren, Sigurd Wallén, Carl Ström und Nisse Lundell. Hervorragende jugendliche Besetzung. Hintergrund des Films: Fußball-Länderkampf Dänemark gegen Schweden. Einer der besten Svensk-Filme.

DEFENDANT'S EXHIBIT R

3265

Defendant's Exhibit R.

TRANSLATION.

from the Film-Kurier of February 6, 1932.

The debate about Bolten-Baeckers.

H a n s V o g t

a "prominent" disinterested party.

3266

At a time when everybody was still swearing by the silent film (1919), it was HANS VOGT who had the courage not only to believe in the sound film but also to carry it out in practice. He joined with Engel and Massolle, sacrificed his position and savings to solve the problem of the sound film. We know that the three inventors were successful. On September 17, 1922, the first one hour sound picture program was demonstrated at the Alhambra at Berlin, using the same method as is still used at the present time by Tobis. We know the unhappy story of this inventor complex.

3267

In a long important document, the general part of which we have for the time being eliminated for reasons of economy of space, HANS VOGT says as follows:

"In the entire sound picture suits which have heretofore been conducted and are still being conducted (above all in the U. S. A.), among many hundreds of patents three patents above all play a deciding role and of which I can call myself the personal inventor.:

the Patent *368,383* of April 14, 1921 which protects the separate development,

3268 *Defendant's Exhibit R.*

the Patent *387,058* of May 22, 1920 which has as its subject matter the uniform motion of the film.

the Patent *417,967* of March 3, 1919 which protects the photo-electric cell and the inertialess source of light.

These patents led to the agreement between Klangfilm and Tobis and impart to the combined companies the character of a monopoly. In the
3269 United States these patents (bought for 200,000 Swiss franks) are owned by William Fox, and he is now conducting suits thereupon in the value of many millions of dollars. It is not permissible that the inventive work as a result of which these patents were created, and the German Patent Office with respect to its examination, be ridiculed as is done by Bolten-Baeckers. The devolping patent is the result of a long series of experiments to protect the proportionality between positive and negative, the flywheel patent the result of detailed studies with re-
3270 spect to the uniformity of the film transport, and in the photo-electric cell and glowlight patent those principal physical proposals are contained which are decisive for inertialess recording of sound frequencies upon strips of film.

An inventor by his efforts serves the general public. His inventions deserve a protection, but it would be desirable to alter the legal character of such protection so that an invention of general interest is not degraded into an object for capitalistic speculation. The development of the talking film within the Tri-Ergon group has cost 60,000 Reichsmark. To give interest on this

Defendant's Exhibit R. 3271

money and to allow a small profit to the inventors and capitalists who financed these experiments would have been a simple matter and been equitable. The German film industry at this time with its old wisdom and prejudices did not interest itself in this matter. An outsider (and speculator) obtained possession of the patents and formed foreign companies of a capital of about thirty to forty million gulden. It should be made clear that the interest on these sums, as to the whereabouts it would be interesting to hear more details, is what primarily causes the high royalties. 3272

3273

DEFENDANT'S EXHIBIT S

Berlin, den 6. Februar 1929.

United States District Court
Eastern District of New York,
Exhibit S in evidence
Date
Clerk
Deputy Clerk

In Sachen

Tonbild-Syndikat Aktien-Ges.

gegen

Klangfilm - G.m.b.H.

Überreiche ich ergebenst anliegenden Antrag auf Erlass einer einstweiligen Verfügung und bitte, mit Rücksicht darauf, dass die beanstandete Tonbildfilm-Vorführung, wie glaubhaft gemacht ist, schon an Freitag, den 8. ds. Mts. 12 Uhr stattfinden soll, um möglichste Beschleunigung Entscheidung auf diesen Antrag.

Für die Zustellung durch den Gerichtsvollzieher gebrauche ich eine Stunde Zeit.

Der Rechtsanwalt:

Landgericht I
16. Zivilkammer

Berlin, den 8. Februar 1929

Landgericht I, Zivilkammer 16.

Berlin

Theodor Kallmann
Rechtsanwalt und Notar
Berlin SW.47, Yorkstr. 76
Fernsprecher: Hasenheide 2113

Berlin, den 5. Februar 1929.

A n t r a g

auf Erlass einer einstweiligen Verfügung der Firma Tonbild-Syndikat Aktien-Gesellschaft in Berlin, Jägerstr. 6, vertreten durch ihren Vorstand Dr. Hans Henkel und Arthur Fritzschknecht,

Antragstellerin,

Prozessbevollmächtigter: Rechtsanwalt Th. Kallmann in Berlin SW.47, Yorkstr. 76

g e g e n

die Firma Klangfilm- G.m.b.H. in Berlin, Askanischer-Platz 4, vertreten durch ihre Geschäftsführer Dr. Kirn und Ackermann,

Antragsgegnerin,

n das

Landgericht I
16. Zivilkammer

B e r l i n

I.

Die Klägerin ist eine Aktiengesellschaft, die sich gebildet hat auf Grund des Zusammenschlusses der früheren Triergon-Aktiengesellschaft, der deutschen Tonfilm-Aktiengesellschaft, der Küchenmeister- und der Vester-Gruppe, kurz aller

s/s

in Deutschland massgebenden Stellen, die sich seit Jahren mit der Schaffung von Tonfilmen beschäftigt haben.

In die Klägerin sind deshalb alle wesentlichen deutschen Patente und Schutzrechte oder die ausschliessliche Lizenz an ihnen, für das Gebiet des Tonbildfilmes, bei ihrer Gründung eingebracht worden.

Das Stammkapital der Antragstellerin beträgt 12 Millionen.

Die Antragsgegnerin ist vor einigen Wochen gegründet worden.

II.

Die Antragstellerin ist Inhaberin der ausschliesslichen Lizenz an dem deutschen Reichspatent 368 383 (Anlage 1).

Vertragsabschrift und eidesstattliche Versicherung über die ausschliessliche Lizenz liegen in Anlage 2) bei.

Der Patentanspruch 1), auf den der nachfolgende Antrag abgestellt ist, lautet

" Verfahren zum Herstellen von Positivfilmen, welche bildreihen- und photographisch aufgenommene Tonschrift enthalten, dadurch gekennzeichnet, dass die Negative getrennt entwickelt werden".

Die Beschreibung des Patentes ist so leicht verständlich, dass zur Vermeidung von Wiederholungen kurzerhand auf sie verwiesen werden kann.

III.

Die Antragsgegnerin ist zwar erst vor wenigen Wochen gegründet worden, geht aber offenbar damit um, mit möglichster Beschleunigung der Antragstellerin das deutsche Geschäft abzukämpfen. Dem Gericht wird bekannt sein, dass die Schaffung des Tonbildfilmes in Deutschland gerade erst im Entstehen begriffen ist und dass von den Interessenten, die sich zur klägerischen Gesellschaft zusammengeschlossen haben, erhebliche Millionenbeträge bereits in der Vergangenheit aufgewandt worden sind, die jetzt erst wirtschaftlich nutzbar zum Ergebnis kommen sollen.

Eine Störung dieses, in der Entwicklung begriffenen Industriezweiges würde also gerade in dem vorliegenden Stadium die Antragstellerin ausserordentlich empfindlich treffen.

Die Antragsgegnerin hat nun einer erheblichen Anzahl von Interessenten angekündigt, dass sie am Freitag, den 8. Februar ds.Jhrs. und an den folgenden Tagen, Tonbildfilme vorführen will. Sie hat diesen Interessenten mitgeteilt, dass

diese zur Vorführung bestimmten Tonbildfilme insbesondere solche der General Electric Comp. (sogenannte Photophone-Filme) sein werden.

Dies wird glaubhaft gemacht durch die eidesstattliche Versicherung des Prokuristen Dr. Hans Böhm,

Diese Photophonfilme der General Electric Comp. sind nun aber nach dem Verfahren des klägerischen Patentes Nr. 368 383 hergestellt, d.h. die Negative sind getrennt entwickelt worden.

Dies wird glaubhaft gemacht durch das anbei überreichte Buch der Transactions of the Society of Motion Picture Engineers, Seite 87.

Hier ist die Herstellung der Filme nach dem Verfahren der General Electric Comp. beschrieben worden. Es ist ohne weiteres zu erkennen, dass das hier beschriebene Verfahren wortgetreu dem in Deutschland patentierten Verfahren entspricht.

Der Ordnung wegen wird eine vollständige Übersetzung der Seite 87 beigefügt, sodass das Gericht ohne weiteres die Nachprüfungsmöglichkeit hat.

Die Produkte also, die in Amerika nach diesen Verfahren hergestellt werden, stellen eine Verletzung des deutschen

Patentes 368 383 dar, sobald sie die deutsche Grenze überschreiten.

IV.

Die Antragstellerin wehrt sich dagegen, dass die Antragsgegnerin nun den Interessenten, die auf den vorliegenden Gebiete den gleichen Kreis darstellen, amerikanische, patentverletzende Produkte vorführt, um für die Antragsgegnerin Reklame zu machen und den Kundenkreis, der auch der der Antragstellerin ist, zu deren Schaden zu beeinflussen.

Die Antragstellerin begnügt sich damit, den nachstehenden Antrag auf den Patentinhalt hin zu beschränken. Allerdings sollen nicht nur die amerikanischen Filme der General Electric Comp, getroffen werden, wenn diese hier in Deutschland von der Antragsgegnerin vorgeführt werden, sondern auch solche Filme, die etwa die Antragsgegnerin in Deutschland in der Weise hergestellt hätte, dass Tonfilme und Bildfilme getrennt entwickelt werden.

V.

Die Dringlichkeit ergibt sich bei dem vorstehend dargelegten Sachverhalt von selbst. Es wird gerichtsbekannt sein, dass dieser ganze Industriezweig in der Entwicklung begriffen ist.

Die Antragstellerin würde später auch nicht nachweisen können, welche Interessenten ihr durch die rechtswidrigen Vorführungen der Antragsgegnerin verloren gegangen sind. Sie muss deshalb Vorsorge treffen, dass dieser Schaden, der später nicht wieder gutzumachen ist, vorher vermieden wird.

Mit Rücksicht darauf, dass die Vorführung schon am Freitag dieser Woche erfolgt, wird gebeten, die Entscheidung ohne mündliche Verhandlung so rechtzeitig zu treffen, dass sie noch der Antragsgegnerin zugestellt werden kann.

Die Antragstellerin ~~verhindert~~ will mit dem nachstehenden Antrag keineswegs die Vorführung von Tonbildfilmen verhindern, die auf eine andere Art entwickelt sein würden, als das Patent 368 383 das Herstellungsverfahren schildert.

VI.

In Vollmacht der Antragstellerin beantrage ich somit:

der Antragsgegnerin wird bei Vermeidung einer vom Gericht festzusetzenden fiskalischen Geldstrafe in unbeschränkter Höhe oder Haftstrafe von 6 Monaten für jeden Fall der Zuwiderhandlung verboten,

im Inhalt des deutschen Briefs

ein Verfahren zum Herstellen von Positivfilmen, welche Bildreihen und fotografisch aufgenommene Tonschrift enthalten, anzuwenden, das dadurch gekennzeichnet ist, dass die Negative getrennt entwickelt werden, und die nach einem solchen Verfahren hergestellten Filme gewerblich feilzuhalten, vorzuführen oder zu gebrauchen.

Den Streitwert gebe ich mit Rücksicht auf die Dringlichkeit und Wichtigkeit dereinstweiligen Regelung auftragsgemäss auf 100.000 Mark an.

Der Rechtsanwalt:

Dr. Ullmann

Anlagen - Verzeichnis :

1.) Patentschrift Nr. 368.323

2.) Eidesstattliche Versicherung des Dipl.Ing.Ehrenhaft,

3.) Buch der Transactions

4.) Deutsche Uebersetzung der Seite 87,

5.) Eidesstattliche Versicherung K a l i n a ,

6.) Prozessvollmacht

7.) Eidesstattliche Versicherung des Dr. B ö h m ,

Den etwa erforderlichen Stempel bitte ich zu den Gerichtskosten zu erfordern.

Prozeß-Vollmacht

—o—

Den Herren

Rechtsanwalt Th. Kallmann, Berlin, Yorkstraße 76

erteile ich hierdurch Vollmacht zur Führung des

von

Kläger

gegen

Beklagte

wegen bei dem gericht zu

anzustellenden (angestellten) Rechtsstreites mit der besonderen Ermächtigung:

1. in den aus der Zwangsvollstreckung, insbesondere in Gemäßheit der §§ 731, 767, 768, 771, 785, 805, 878 Z.P.O. entstehenden Prozessen, sowie im Verfahren behufs Eröffnung des Konkurses über das Vermögen des Gegners, im Konkurse selbst und in den durch das Konkursverfahren entstehenden Rechtsstreitigkeiten zu vertreten;
2. dem zahlungspflichtigen Gegner Stundung zu gewähren;
3. von der Gegenpartei und aus der Konkursmasse den Streitgegenstand selbst, auch wenn sich derselbe bei der Hinterlegungsstelle befindet, in Empfang zu nehmen.
4. Aufrechnungserklärungen für abzugeben und entgegenzunehmen;
5. sechs Monate nach rechtskräftiger Entscheidung des Rechtsstreites die nicht abgehobenen Handakten zu vernichten.
6. die auf Verlangen gefertigten Abschriften außer der Auslagenpauschsumme des § 76 der Gebührenordnung in Rechnung zu stellen.

, den ten 192

TONBILD-SYNDIKA.
AKTIENGESELLSCHAFT

Eidesstattliche Versicherung.

Ich bin Leiter der Patentabteilung der Tonbild-Syndikat - Aktiengesellschaft in Berlin Jägerstr.6.

Ich weiss aus eigener Kenntnis, dass durch Vertrag vom 30. August 1928 der Firma Tonbild-Syndikat- A.G. (Tobis) die ausschliessliche Generallizenz für das Patent Nr.368.383 erteilt worden ist. In dem Vertrage heisst es wörtlich, dass der Tobis an den den Gegenstand des Vertrages bildenden Rechten " eine zeitlich, örtlich,qualitativ, quantitativ unbeschränkte ausschliessliche Generallizenz " eingeräumt wird.

Ausgenommen sind dann bei den Ländern die Vereinigten Staaten von Nord-Amerika,Kanada,Mexiko und die nordamerikanischen Kolonien.-

In § 2 des Vertrages heisst es dann ferner wörtlich: " Tobis hat das Recht, im Rahmen der Generallizenz alle Patentbefugnisse im eigenen Namen auf seine Kosten positiv und in Abwehr auszuüben."

Obiges versichere ich an Eidesstatt.

Berlin,den 6. Februar 1929

Georg Graf

1103

Eidesstattliche Versicherung.

Ich versichere folgendes an Eidesstatt:

Ich bin Prokurist der Firma Tonbild-Syndikat-Aktiengesellschaft.

Mir haben in den letzten Tagen mehrere Filmfachleute mitgeteilt, dass im Universum-Kino am Lehniner Platz seitens der Klangfilm- G.m.b.H. wiederholt Vorführungen stattgefunden haben, bei welchen Tonbildfilme gezeigt wurden.

Die Herren von der Klangfilm-G.m.b.H, hätten erklärt, es handle sich u.a. insbesondere um Tonbildfilme, die nach dem amerikanischen Verfahren der R.C.A. Photophone (General Electric Company) hergestellt seien.

Das General Electric Verfahren ist beschrieben in dem Buch Transactions of the Society of Motion Picture Engineers, Band XII Nr. 33 vom April 1928 auf Seite 87.

Ich möchte die Namen dieser Gewährsleute zunächst nicht nennen, weil sie auch mit uns in Geschäftsverbindung stehen und weil meiner eigenen Firma dadurch unter Umständen Nachteile entstehen könnten.

Berlin, den 6. Februar 1929.

Hans Böhm

E I N L A D U N G :

Die Klangfilm G.m.b.H., Berlin, gestattet sich Ew. Hochwohlgeboren zu der am Freitag, dem 8. Februar 1929, mittags 12 Uhr, im

UFA-THEATER-UNIVERSUM, LEHNINER-PLATZ

stattfindenden Vorführung ergebenst einzuladen.

Es werden vorgeführt, Tonbildfilme, Bildfilms mit synchronisierter Musikbegleitung, sowie Klang- und Wochenschau, ferner Beispiele für Ouvertüren u. Zwischenmusik.

KLANGFILM G.M.B.H.
Berlin SW.11, Askanischer-Paltz 4

=:=:=:=:=:=:=:=:=:=:=:=:=:=:=:

Hiermit versichere ich an Eides statt, dass die vorstehende Abschrift von mir wortgetreu abgeschrieben worden ist.
Berlin, den 6. Februar 1929

Marg. Kyslinn

1105

Uebersetzung

der Seite 87 von "Motion Pictures with Sound-Marvin".

..... Die Erfahrung der General Electric Company in der Entwicklung von Lautsprechern hoher Qualität ist ausgenützt worden, und man glaubt, dass die gegenwärtige Form die zurzeit bestmögliche darstellt. Widerhall in dem Raum, in dem der Ton wiedergegeben wird, kann natürlich das Ergebnis beeinträchtigen und sollte bei jeder einzelnen Installation berücksichtigt werden.

Es sollte noch eine andere Form der Störung, die man nicht eigentlich Verzerrung nennen kann, erwähnt werden. Das ist das Vorhandensein von Lärm von aussen, wie Summgeräusche, mechanische Schwingungsgeräusche, Radiostörungen etc.

Die Hauptpunkte in der Entwicklung des Systems sind skizziert worden. Es soll hier nicht versucht werden, die Lösung der obigen Fragen im Einzelnen zu besprechen. Man hat im Laboratorium eine leidlich umfassende Kenntnis des Prozesses erlangt in seinen wesentlichen Punkten und ist in stetem Fortschritt zur völligen Ausmerzung der Fehler begriffen. So ist das Hemmnis, das 30 J vor denen stand, die daran arbeiteten, dem kinematographischen Bild den Ton zuzufügen, im Begriff, überwunden zu werden.

Das zu demonstrierende System kann, wie folgt, skizziert werden: Bilder, die mit einer Normalkamera mit gleichmässiger Schnelligkeit aufgenommen werden, ergeben ein Bildnegativ von der selben Grösse wie bei der jetzigen

Theodor Hallmann
Rechtsanwalt und Notar
Berlin SW.47, Yorckstr. 7b
Fernsprecher: Hasenheide 2118

Jetzt Fernsprecher: F. 5. Bergmann 2118

Berlin, den 8. Februar 1929.

In Sachen
Tonbild-Syndikat A.G.
gegen
Klangfilm - G.m.b.H.

Eilt sehr!

überreiche ich ergebenst die Urschrift eines Schreibens der Firma S. Klein (Lyra-Film) an meine Partei.

Der Inhalt dieses Schreibens zeigt ganz eindeutig, dass die Klangfilm-G.m.b.H. die Herstellung von Tonbildfilmen anbietet, die nach dem Patent der Antragstellerin Nr. 368 383 entwickelt worden sind.

Der Rechtsanwalt:

Hallmann

das
Landgericht I
16. Zivilkammer

Berlin

1107

S.Klein
Logos,Kultur und Spielfilm G.m.b.H.
SW.48.Friedrichstr.236.

Berlin,7.Februar 1929.
Nürnbergerst.6.

Eingegangen
18 FEB 1929
die

Tonbild-Syndikat Aktiengesellschaft

B e r l i n W 8,
Jägerstr.6.

Anläßlich der seinerzeit mit Ihnen geführten Verhandlungen, betreffend die Herstellung von Reklamefilmen,versprachen Sie mich beiProduktionsmöglichkeit verständigen zu wollen.Inzwischen habe ich ersehen,daß Ihre Produktion bereits soweit fortgeschritten ist,daß unsere Verhandlungen konkreter gestaltet werden konnten.Ich bitte Sie mir deshalb mitzuteilen ob ich in absehbarer Zeit mit der Filmherstellung rechnen kann.

Da ich von Ihnen lange nichts gehört habe,bin ich auch mit der Klangfilm G.m.b.H.in Verbindung getreten und werde selbstverständlich auch dieses System bei der Durchführung meines Programms in Konkurrenz ziehen.Für mich ist allenfalls ausschlaggebend nach welchem System die Herstellungskosten billiger sind.Wie mir bei der Klangfilmgesellschaft gesagt wurde, muß bei der Aufnahme nach deren System,mit doppelten Kosten gerechnet werden,weil die Aufnahme der Töne und Bilder auf je einen besonderen Film erfolgen,die einzeln entwickelt werden müssen und erst nachher auf einen gemeinsamen Positivfilm kopiert werden können.

Ich frage Sie nun an ob bei Ihrem Aufnahmeverfahren auch diese doppelten Kosten entstehen.Für mich wäre es natürlich von großer Bedeutung,wenn aus Ersparnisgründen die Aufnahmen gleich auf einen gemeinsamen Film gemacht und dieser dann in einer gewöhnlichen Kopiermaschine vervielfältigt werden könnte.Seien Sie bitte so freundlich und informieren Sie mich darüber und nennen Sie mir bitte auch gleichzeitig Ihre Preise für Vorführungsapparate,welche möglichst transportabel sein

sollen. Teilen Sie mir freundlichst auch mit, ob Sie jetzt schon in der Lage sind mir einen Aufnahmeapparat zu liefern oder unter welchen Bedingungen Sie mir einen solchen zeitw[illegible] zur Verfügung stellen könnten.

In Erwartung Ihrere baldigen Nachrichten, empfehl[illegible] ich mich Ihnen

hochachtungsvoll

J. Selen

.G.29

18

Landgericht I Berlin

Gesch.Nr. Q 33 Q 5 29

Kostenrechnung

in Sachen Forbild – Syndikat f. d. Klangfi

Lfd. Nr.	Blatt der Akten	Gegenstand des Kostenansatzes	Wert des Gegenstandes R.M.	zu erheben sind überhaupt R.M.	Rpf.	Bemerkungen
1		Gebühr für das Verfahren § 32 Nr. 1 D.G.K.Ges.	10.000	65	—	A Sperrmitt. auf Gutha.
2		Vollmachtstempel Tarifst. 19 St.St.G.				
2		Porto hierfür				
				65,08		33258 28

Schuldner: Gutkaufst.

Berlin, den 11. Feb 1929

Justizinspektor-Justizobersekretär.

2.3.29

Rechtsanwälte und Notare
Dr. Danziger
Dr. Münninghoff
Berlin W. 10
Margaretenstraße 8
Noll. 1596/97.

Berlin, den 15. Februar 1929 .

15. II.

In Sachen
Tonbild gegen Klangfilm
B.Q. 5.29

2

Eilt sehr.

Überreichen wir anliegend Widerspruch und Ladung .

Mit Rücksicht darauf, dass die einstweilige Verfügung binnen wenigen Stunden ohne mündliche Verhandlung vom Gericht gegeben wurde, dürfte es ein Gebot ausgleichender Gerechtigkeit sein, dass es mit Rücksicht auf die Wirkungen der einstweiligen Verfügung notwendig ist , den Termin zur Verhandlung über den Widerspruch , alsbald anzuberaumen .

Es wird gebeten ,
Termin auf den nächsten Terminstag , den 19.d.Mts. anzuberaumen und die Ladungsfrist auf 24 Stunden abzukürzen .

Rechtsanwalt .

An das
Landgericht I,
Berlin .
- -.-.-.-.-.-

D/D

1111

Rechtsanwälte u. Notare
Dr. Danziger
Dr. Münninghoff
Berlin W. 10
Margaretenstraße 8
Noll. 1596/97.

Gerichtsabschrift.

Berlin, den 14. Februar 1929.

W i d e r s p r u c h

In Sachen

der Firma Tonbild-Syndikat Aktiengesellschaft in Berlin, Jägerstrasse 6, vertreten durch ihren Vorstand, Dr. Hans Henkel und Arthur Frischknecht,

-Prozessbevollmächtigter: Rechtsanwalt Th. Kallmann, Berlin SW.47, Yorckstrasse 76-

gegen

die Firma Klangfilm G.m.b.H. in Berlin, Askanischer Platz 4, vertreten durch ihren Geschäftsführer Dr. Kirn und Dr. Akemann,

-33. O. 5/29-

Verhandlungstermin
am 21. 2. 1929 Uhr
Gerichtsgebäude Grunerstraße
Stadtwerk, Zimmer Nr. 6
Berlin, den 17. 2. 1929
Landgericht I
Zivilkammer 12
Der Vorsitzende.

das
Landgericht I
B e r l i n .

überreichen wir Vollmacht der Antragsgegnerin und legen gegen den Beschluss des Landgerichts I Berlin vom 8. 2. 29

Widerspruch

ein, mit dem Antrage,

die einstweilige Verfügung vom 8. 2. 29 insoweit aufzuheben, dass hinter dem Wort "welche" eingefügt werden die Worte: "auf einem Filmband".

Zur mündlichen Verhandlung über diesen Widerspruch laden wir die Antragstellerin vor das angerufene Gericht zu Händen ihres Prozessbevollmächtigten, Rechtsanwalt Th. Kallmann, Berlin SW.47, Yorckstrasse 76, zu dem von dem Herrn Vorsitzenden anzuberaumenden Termin mit der Aufforderung, etwaige Einwendungen und

P. beweis-

Beweismittel dem Gericht und dem unterzeichneten Prozessbevollmächtigten in einem Schriftsatz mitzuteilen.

Begründung:

Der vorliegende Widerspruch richtet sich im Augenblick gegen die einstweilige Verfügung nur insoweit, als dies in dem vorstehenden Antrage zum Ausdruck gebracht ist.

Liest man den Antrag vom [illegible] und die [illegible] beigefügte Uebersetzung der Seite [illegible] von Blatt [illegible], so erhält man zunächst den Eindruck, als ob sich der Antrag richtet gegen ein Herstellungsverfahren, bei dem Ton- und Bildfilme getrennt entwickelt, dann aber von beiden ein kombiniertes Positiv auf einem einzigen Film erzeugt wird.

Am Schluss von IV der Begründung des Antrages kommt die erste Unklarheit, indem dort gesagt ist, der Antrag solle sich auch richten gegen solche Filme, die etwa von der Antragsgegnerin in Deutschland hergestellt werden, und bei denen Tonnegativ und Bildnegativ getrennt entwickelt werden. Hier fehlt das Merkmal der Vereinigung der getrennt entwickelten Filme zu einem Film. Ebenso fehlt das Merkmal im Antrag. Und es fehlt auch in dem erlassenen Beschluss.

Die Filme, welche die Antragsgegnerin in Deutschland hergestellt hat, entstehen so, dass stets Ton und Bild auf getrennten Filmstreifen sich befinden. Die Aufnahme von Ton und Bild erfolgt auf getrennten Bildstreifen, die Entwicklung erfolgt auf getrennten Bildstreifen und die Herstellung der Positive erfolgt auf getrennten Bildstreifen. Bei der Wiedergabe werden Ton und Bild von getrennten Bildstreifen abgerollt.

Dass das nicht unter das Patent 368 383 fällt, bedarf keiner Ausführung. Der Wortlaut der einstweiligen Verfügung, ob es nun so gemeint ist oder nicht, geht aber weiter. Und auf ausdrückliche briefliche Anfrage, ob die Antragstellerin keine Rechte aus der einstweiligen Verfügung herleitet, soweit Ton und Bild von getrennten Filmstreifen bei der Wiedergabe abrollen, ist die Erteilung einer Antwort abgelehnt worden.

Die Antragsgegnerin ist nicht eine Firma der Art, wie sie im gegnerischen Antrag zu charakterisieren versucht wird, sondern ist eine sehr ernste Industriefirma, deren verantwortliche Leiter Sicherheit haben müssen, dass das geschilderte, von ihnen bei der Herstellung von Bildtonfilmen bisher geübte Verfahren nicht von der einstweiligen Verfügung betroffen wird.

gez. Dr. Danziger

Rechtsanwalt.

Den etwa erforderlichen Stempel bitte ich zu den Gerichtskosten zu erfordern.

Prozeß-Vollmacht.

Den Herren Rechtsanwälten und Notaren

Dr. Georg Jac. Danziger
Dr. Richard Nünninghoff
in **Berlin W 10,** Margaretenstraße 8

erteile n wir hierdurch Vollmacht zur Führung des

von der Firma Tonbild-Syndikat Akt.-Ges. in Berlin, Jaegerstr. 6
Antragstellerin, Klägerin

uns

gegen

Antragsgegnerin, ~~Beklagte~~

wegen eins w. Verf. bei dem Land----- I Gericht zu Berlin

Aktenzeichen: 33 Q. 5.29 ~~anzustellenden~~ (angestellten) Rechtsstreites mit der besonderen Ermächtigung:

1. uns in den aus der Zwangsvollstreckung, insbesondere in Gemäßheit der §§ 731, 767, 768, 771, 785, 805, 878 ZPO. entstehenden Prozessen, sowie im Verfahren behufs Eröffnung des Konkurses über das Vermögen des Gegners, im Konkurse selbst und in den durch das Konkursverfahren entstehenden Rechtsstreitigkeiten zu vertreten;
2. dem zahlungspflichtigen Gegner Stundung zu gewähren;
3. von der Gegenpartei und aus der Konkursmasse den Streitgegenstand selbst, auch wenn sich derselbe bei der Hinterlegungsstelle befindet, in Empfang zu nehmen;
4. Aufrechnungserklärungen für uns abzugeben und entgegenzunehmen;
5. sechs Monate nach rechtskräftiger Entscheidung des Rechtsstreites die nicht abgehobenen Handakten zu vernichten;
6. für sämtliche Gebührenforderungen aus dieser Angelegenheit ist zuständig das gericht zu

Mehrere Bevollmächtigte sind samt und sonders zur Vertretung legitimiert.

Berlin, den 14 ten Februar 192 9.

Klangfilm Gesellschaft mit beschränkter Haftung

Form 305

1115

Theodor Kellmann
Rechtsanwalt und Notar
Berlin SW ...

Reichspatentamt

Berlin SW 61, den 20. 2. 1929.
Gitschiner Straße 97-103

Aktenzeichen M 16437 IX/32a 2

Patentnummer 368383

An das Landgericht I

Aktenz. u. Name bei allen Eingab...
Für bargeldlose Zahlungen: Das Reichspatentamt hat
a) Reichsbank-Girokonto ...
b) Postscheckkonto: ...
c) Konto 20073 bei der Brandenburgischen Provinzialbank und Girozentrale, ...

Fernsprechstelle des Landgerichts I
20 FEB 1929 12-15 d.
Amtsgerichts Berlin-Mitte

In Berlin C 2.
Neue Friedrichstr. 13/15
338

Zur Sache Sonderverfahren Kalk/Klangfarbe

(Geschäftszeichen) 32a 5. 29

Auf das Schreiben vom 5. 2. 29 folgen anbei die Akten betr. Pat. 368383 mit dem Ersuchen um Rückgabe nach gemachtem Gebrauche.

Falls die Sache ihren Abschluß durch ein Urteil findet, wird um abschriftliche Mitteilung desselben nach eingetretener Rechtskraft nebst den Akten des gerichtlichen Verfahrens ergebenst ersucht.

Anmeldeabteilung A.
~~Prüfungsstelle für Klasse~~
J. A.
Regierungs...

~~Frei durch Ablösung~~
~~Reich~~

~~Einschreiben~~

Kop

Abtragen

gegen Empfangsschein.

Kop. Pat. 77a.
IX. 1927. 500.

3216

Öffentliche Sitzung des Landgerichts I

16. Zivil — Kammer — ~~für Handelssachen~~

Berlin, den 27 Februar 1929

In Sachen

Toubiler ./. Klangfilm

Gegenwärtig:

1. LGR Lauburger als Vorsitzender,
2. a. LR Kopf
3. Ger. Ass. Dr. Kurz als beisitzende Richter,

Aug. Lenz als Urkundsbeamter der Geschäftsstelle.

erschienen bei Aufruf

1. für die ~~Kläger~~ der Rechtsanwalt Dr. Kallmann
   RA. Meltzer für Rechtsanwalt Dr. Ehrenbaum
   an Stelle des RA. Dr. Hagen
2. für die ~~Beklagte~~ der Rechtsanwalt Dr. Salinger
   Justizrat Dr. Ernst

Der Anwalt des ~~Klägers~~ Antragstellers verlas — ~~nahm Bezug~~ auf — den Antrag der ~~Klageschrift~~ Schriftsätze vom 22.11.29

Der Anwalt des ~~Beklagten~~ verlas — nahm Bezug auf — den Antrag des Schriftsatzes vom 14.2.29, 22.2.29

Die Anwälte verhandelten sodann zur Sache.

Beschluß

Der Streitwert wird vorläufig für die Kostenberechnung und Abkürzungsfrist für Berufungsschrift auf 100 000 RM festgesetzt.

Verkündet am 1. März 1929

Lenz

Justizsekretär

---

gef. 25.2.29 Häuler
2 lg. Urt.-Ausf. je 8 S.
2 k.
33.00 S. 29 + 4

1117

Berlin [illegible]
Fernsprecher: Hansaheide 2118

Berlin, den 22. Februar 1929

25 Ga

In Sachen:

Tonbild gegen Klangfilm

-30.Q.5.29.-

2. 1/9 I

beantrage ich:

den Widerspruch der Antragsgegnerin zurückzuweisen und den Beschluss vom 8.Februar c[illegible] zu bestätigen.

Der Rechtsanwalt·

gez.Kallmann

An das

Landgericht I

B e r l i n

Fernsprecher: Kaiserhof 2118 Beglaubigte Abschrift

Dr. Kallmann
Rechtsanwalt und Notar
Berlin SW.47, Yorckstr. 75
Fernsprecher: Hasenheide 2118

Berlin, den 22. Februar 1929

In Sachen:
Tonbild gegen Klangfilm
-33.Q.5.29.-

beantrage ich:
den Widerspruch der Antragsgegnerin zurückzuweisen und den Beschluss vom 8.Februar cr zu bestätigen.

Der Rechtsanwalt:
gez.Kallmann

An das
Landgericht I
B e r l i n

Zwecks Zustellung beglaubigt
Berlin, den 22.Februar 29
Rechtsanwalt:
Kallmann

Theodor Kallmann,
Rechtsanwalt und Notar,
Berlin SW. 68, Yorckstr. 76,
Fernsprecher: [illegible]

Berlin, den 22. Februar 1929.

S c h r i f t s a t z

in Sachen der Firma: Tonbild-Syndikat Aktiengesellschaft in Berlin, Jägerstrasse 6, vertreten durch ihren Vorstand, Dr. Hans Henkel und Arthur Fritschknecht,

Prozessbevollmächtigter: Rechtsanwalt Th. Kallmann, Berlin SW, Yorckstr. 76-

gegen

die Firma Klangfilm G.m.b.H. in Berlin, Askanischer Platz Nr. 4, vertreten durch ihre Geschäftsführer Dr. Kirn und Dr. Akomann.

Der Antrag auf Zurückweisung des Widerspruchs der Antragsgegnerin wird wie folgt begründet:

1. Der Beschluss des Landgerichts schliesst sich wortgetreu dem Patentanspruch 1 an. Im vorliegenden Fall durfte dies geschehen, weil damit gleichzeitig der konkrete Tatbestand getroffen wird, ohne jede Abweichung. Dies beweist die Veröffentlichung in den "Motion Pictures with Sound-Marvin", Seite 87.
2. Es ist aber auch nicht erforderlich, die Worte "auf einem Filmband" in den Beschluss einzuschalten, weil dadurch höchstens eine Unklarheit hineingetragen wird.

An das
Landgericht I,
B e r l i n .

Im Beschluss vom 8.Februar 1929 und ebenso im Patentanspruch 1 befindet sich die ausdrückliche Kennzeichnung, dass es sich um Positivfilme handelt, "welche Bildreihen und photo-

gemäss aufgenommene Tonschrift enthalten".

Damit ist deutlich gesagt, dass die Positivfilme sowohl die Bildreihen als auch Tonreihen enthalten sollen. Andernfalls hätte anstelle des Und ein „Oder" stehen müssen.

Man wird dem Patentamt nicht vorwerfen können, dass es bei Fassung von Patentansprüchen nicht sorgfältig genug verfährt.

5). Durch die Einschaltung der Worte "auf einem Filmband" wird noch die weitere Gefahr einer Unklarheit nach der Richtung hin hervorgerufen, als ob die Antragsgegnerin aus dem Patent dadurch herauskäme, dass sie den nach dem Patent hergestellten einheitlichen Positivfilm nachträglich zerschneidet und die beiden Teilstreifen synchronisiert vorführt.

Eine weitere Unklarheit wurde ebenfalls geschaffen bei Gelegenheit des üblichen Vorführungsverfahrens, bei welchem mehrere Positivfilme hintereinander (also der Länge nach) aneinander geklebt werden, so dass nicht mehr ein Filmband vorhanden ist.

Der Beschluss vom 5. Februar 1929 ist sachgemäss formuliert und bedarf keiner Ergänzung oder Berichtigung.

Der Rechtsanwalt:

Allmann

1121

Empfangsbekenntnis.

19

In Sachen

Feuerlein gegen Blumenfeld

Geschäftsnummer: 33 C 5. 29 F. 1/3

habe ich Rechtsanwalt Dr. Arthur Hahn

in meinem Büro erhalten.

Berlin, den 26. 2. 29

Zurück gesandt
28. Feb. 1929

Öffentliche Sitzung des Landgerichts I

Zivil- Kammer 16.

Berlin, den 1. März 1929

In Sachen

Loubier-Syndikat gegen Klempfleu

Gegenwärtig:

1. L.G.R. Dr. Hamburger
als Vorsitzender
2. Ger. Ass. Dr. Pfeifer
3. " " Dr. Knapp
als beisitzende Richter.
Aug. Leiß
als Gerichtsschreiber
als Urkundsbeamter der Geschäftsstelle
des Landgerichts I.

erschien bei Aufruf: niemand

~~1. für d~~ Kläger
der Rechtsanwalt

2. für d Beklagte
der Rechtsanwalt

Der Anwalt de
beantragte Vertagung.

Der Gegner war einverstanden.

Es wurde der Beschluß verkündet:

Die Sache wird vertagt

auf den 19 vormittags Uhr.

Es wurde anliegender Beschluß verkündet.

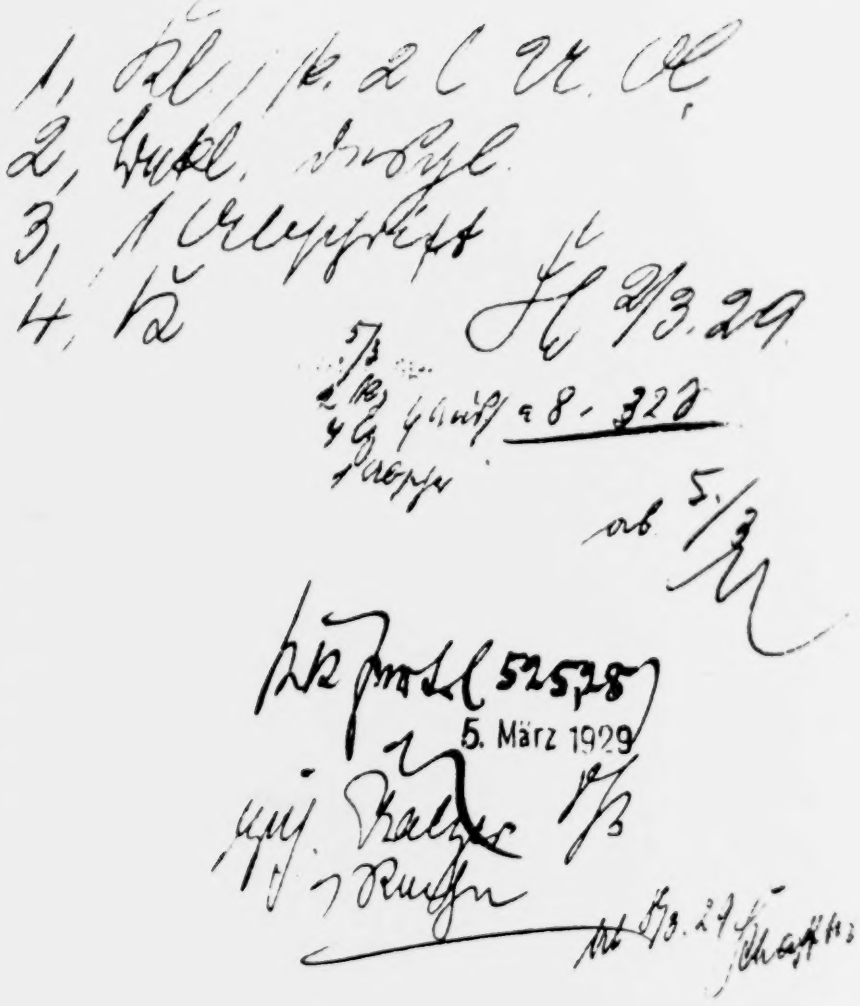
L.G.R. Dr. Hamburger

Dr. 41 Vertagung auf Antrag der Parteien – Landgericht I.

33. 6. 5. 29/6

Dr. Knapp

Leiß



5. März 1929

Kammer für Handelssachen I. d. Berg[illegible]

33 O 5.29

- 1. März 1929

I M N A M E N D E S V O L K E S !

Verkündet
am 1. März 1929
als Urkundsbeamter
der Geschäftsstelle.

In Sachen

der Firma T O N B I L D - S Y N D I K A T Aktien-Gesellschaft
in Berlin, Jägerstrasse 6,
vertreten durch ihren Vorstand: Dr.Hans Henkel und
Arthur Frischknecht,
Antragstellerin,
-Prozessbevollmächtigter: Rechtsanwalt Theodor Kallmann in Berlin SW 47, Yorkstrasse 76 -

gegen

die Firma K L A N G F I L M - G.m.b.H. in Berlin,
Askanischer-Platz 4,
vertreten durch ihre Geschäftsführer Dr.Kirn und Dr.Akermann,
Antragsgegnerin,
-Prozessbevollmächtigte: Rechtsanwälte Dr. Danziger und Dr.Nünninghoff in Berlin W 10, Margaretenstrasse 8 -

wegen Patentstreits - Streitwert 100.000 RM -

hat die 16. Zivilkammer des LANDGERICHTS I in BERLIN auf die mündliche Verhandlung vom 22. Februar 1929 unter Mitwirkung des Landgerichtsrats Dr. Hamburger, des Amts- und Landrichters Kopf und des Gerichtsassessors Dr.Knapp für Recht erkannt:

Die einstweilige Verfügung vom 8.Februar 1929 wird bestätigt und die Antragsgegnerin verurteilt, auch die weiteren Kosten des Verfahrens zu tragen.

Tatbestand:

5/33

T A T B E S T A N D

Die Antragstellerin ist Generallizenznehmerin des mit Wirkung vom 15.April 1921 erteilten DRP. 368 383, dessen Anspruch 1. lautet:

"Verfahren zum Herstellen von Positivfilmen, welche Bildreihen und photographisch aufgenommene Tonschrift enthalten, dadurch gekennzeichnet, dass die Negative getrennt entwickelt werden.

Auf die Patentschrift wird verwiesen.

Die Antrag-stellerin trug vor, die Antragsgegnerin sei im Begriff, am 8.Februar 1929 Tonbildfilme vorzuführen, die von der General Electric Comp (sogenannte Photophone-Filme) hergestellt seien. Die Herstellung dieser Filme erfolge, wie aus dem Buch "TRANSACTIONS OF THE SOCIETY OF MOTION PICTURE ENGINEERS" Seite 87 hervorgehe, in der Weise, dass der Tonfilm und der Druckfilm einzeln aufgenommen, entwickelt, dann zusammen in einer Kopiermaschine vereinigt würden, so dass eine kombinierte Kopie auf einen einzigen Film erzeugt werde. Dieses Verfahren falle unter das DRP. 368 383. Bei der jungen Entwicklung dieses Industriezweiges sei für die Antragstellerin eine besondere Gefahr durch solche Patentverletzungen gegeben.

Die Antragstellerin erwirkte auf Grund dieses Vortrages die einstweilige Verfügung vom 8.Februar 1929, durch welche der Antragsgegnerin verboten wurde, "ein Verfahren Herstellen von Positivfilmen, welche Bildreihen und photographisch aufgenommene Tonschrift enthalten, anzuwenden",

bei 5/34

bei welchem die Negative getrennt entwickelt werden. Die Antragsgegnerin legte gegen diese einstweilige Verfügung Widerspruch ein.

Die Antragstellerin beantragt:

die einstweilige Verfügung zu bestätigen.

Die Antragsgegnerin beantragt:

die einstweilige Verfügung insoweit aufzuheben, dass hinter dem Wort "welche" eingefügt würden die Worte: "auf einem Filmband".

Sie trägt vor, sie wolle vorerst die einstweilige Verfügung im übrigen nicht angreifen, jedoch sei die Formel unklar. Man könne zunächst meinen, dass sie nur Filme behandle, bei denen zugleich Ton- und Bildfilme enthalten seien. Indessen richte sich auch gegen Filme, welche nach der Begründung ihres Antrags gegen Herstellungen der Antragsgegnerin in Deutschland selbst. Diese aber würden so hergestellt, dass stets Ton und Bild sich auf getrennten Filmstreifen befänden, und zwar sowohl bei der Aufnahme als auch beim Entwickeln, Kopieren und Abrollen. Dieses Herstellungsverfahren dürfe durch die einstweilige Verfügung nicht verboten werden, zumal es durch die überreichte britische Patentschrift 105 589 bereits bekannt gegeben sei. Die Antragstellerin habe gleichwohl auf die Anfrage der Antragsgegnerin, ob sie Rechte aus der einstweiligen Verfügung gegen Tonfilme herleite, soweit Ton und Bild von getrennten Filmstreifen abrollten, keine befriedigende Antwort gegeben. Bei dieser

Sachlage

Sachlage sei es unbedingt notwendig, die Formel der einstweiligen Verfügung zu ändern.

Die Antragstellerin ist dem entgegengetreten.

Es wird im übrigen auf den vorgetragenen Inhalt der Schriftsätze und der zur Glaubhaftmachung überreichten Anlagen verwiesen.

E N T S C H E I D U N G S G R Ü N D E :

Die Antragsgegnerin bestreitet das Vorliegen eines Arrestgrundes nicht. Tatsächlich ist dieser auch gegeben, da gerade die Tonfilm-Industrie in starker Entwicklung ist und gerade jetzt Patentverletzungen der Antragstellerin unabsehbaren Schaden bringen könnten.

Ebenso kann an sich der Arrestanspruch nicht bestritten werden. Nach dem DRP. 368 383 ist es ~~an sich~~ von grossem Vorteil, die Tonschrift und die Bildreihe bei sprechenden Filmen auf einen gemeinsamen Träger, ein Filmband aufzubringen. Schwierigkeiten ergeben sich aber hierbei insofern, als bei der Aufnahme die Bildreihe über- oder unterbelichtet werden kann, während die Tonzeichenreihe stets normal belichtet ist. Diese Unterschiede lassen sich durch Entwickeln nicht ausgleichen. Der Erfinder setzte sich also die Aufgabe, diese Schwierigkeiten zu beheben und löst diese Aufgabe dadurch, dass die Negative getrennt entwickelt werden. Hierbei ist es gleichgültig, ob die Aufnahme schon getrennt erfolgt oder aber ob sie auf einem Film vorgenommen wird, der zum Entwickeln geteilt wird. Ebenso ist es gleichgültig, ob die Herstellung des

einheitlichen

einheitlichen Positivfilmes dadurch erfolgt, dass man die beiden Negativfilme nacheinander auf dem gleichen Positivfilm kopiert oder ob man die beiden Negativfilme vorher miteinander verklebt und nun die Kopie auf einmal vornimmt.

Hiernach erstreckt sich der Schutzbereich des Patents auf ein Verfahren zum Herstellen von Positivfilmen, welche sowohl Bildreihen als auch Tonschrift enthalten, bei welchen die Negative getrennt entwickelt werden. Auch der Stand der Technik steht dieser Auslegung nicht entgegen, soweit bisher von der Antragsgegnerin Material überbracht ist. Die britische Patentschrift 105 589 beschreibt ein Verfahren, bei welchem sowohl bei der Aufnahme wie beim Entwickeln und Kopieren getrennte Bild- und Tonfilme vorhanden sind. Auch das Abrollen der Filme erfolgt nach dieser Patentschrift in der Regel getrennt und unter synchroner Zusammenfassung. Lediglich Seite 6, Zeile 30 bis 32, ist die Möglichkeit erwähnt, die beiden Positivfilme nach der Kopie und vor dem Abrollen an den überhängenden Kanten zusammenzukleben, so dass tatsächlich ein Film da ist. Bis zum Stadium des Abrollens kennt jedenfalls diese Patentschrift keinen gemeinsamen Film.

Bei dieser Auslegung des Klagepatents besteht kein Zweifel, dass das Verfahren, welches die General Electric Comp. nach dem überreichten Artikel anwendet, unter das Klagepatent fällt, da bei diesem Verfahren die Filme zwar getrennt aufgenommen und entwickelt, aber bei der Kopie vereinigt werden, so dass also Positivfilme vorhanden sind,

<u>welche</u>

welche Bildreihen und Tonschriften enthalten, und bei denen die Negative getrennt entwickelt sind. Dieses Verfahren fällt klar unter dem Wortlaut des Patentanspruch so dass das diesem Anspruch entsprechende Verbot der einstweiligen Verfügung den Verletzungsfall klar beschreibt.

Die Antragstellerin meint, diese Fassung sei unklar, da hierunter auch Verfahren fallen könnten, bei denen Aufnahme, Entwicklung, Kopie und Abrollen auf getrenntem Filme erfolge. Dem kann nicht beigetreten werden. Die Antragstellerin selbst hat in der mündlichen Verhandlung erklärt, dass sie ein solches Verfahren nicht als unter das Patent fallend ansehe. Dies wäre auch nach dem Stande der Technik infolge der britischen Patentschrift 405 589 nicht möglich. Liest man aber den Wortlaut der einstweiligen Verfügung unbefangen, so fällt ein solches Verfahren auch nicht darunter, weil nach dieser immer Positivfilme, vorausgesetzt sind, welche Bildreihen und photographisch aufgenommene Tonschrift enthalten, d.h. jeder Film muss beides enthalten.

Die Antragstellerin stützt nun ~~selbst~~ ihr Verlangen auf Berichtigung des ~~Urteils~~ Tenors darauf, dass die Antragegnerin ihr keine befriedigende Antwort auf ihre Anfrage gegeben habe. Allein die Antragstellerin war hierbei durchaus im Recht, denn in der Anfrage der Antragsgegner die in der mündlichen Verhandlung verlesen ist, steht nicht das ganze Verfahren der Antragsgegnerin beschrieben, sondern es war nur angefragt, ob getrennt abrollende Filme unter das Verfahren fielen. Diese Anfrage konnte aber die

Rechtsanwälte
... und Notar
... Yorckstr. 76
... Hauptbüro: Hauptbüro 2118
T. S. Bergmann 21 3

Antragstellerin nicht beantworten, da das getrennte Abrollen allein nicht genügt, um aus dem Patent herauszukommen, wenn in einem früheren Stadium des Verfahrens, etwa bei der Kopie, ein gemeinsamer Film vorhanden war, der zum Abrollen getrennt wird. Ein solches Verfahren würde, soweit der Standpunkt der Technik bisher zu übersehen ist, ebenfalls unter das Patent der Antragstellerin fallen. Infolgedessen konnte die Antragstellerin nach Lage der Sache vor näherer Klarstellung des Verfahrens der Antragsgegnerin keine befriedigende Antwort geben, ohne dass aus dieser Tatsache auf eine Unklarheit der einstweiligen Verfügung geschlossen werden dürfte.

Nun würde freilich der von der Antragsgegnerin gewünschte Zusatz in die einstweilige Verfügung aufgenommen werden können, wenn er geeignet wäre, die Klarheit der einstweiligen Verfügung zu verstärken und Zweifel im Zwangsvollstreckungsverfahren auszuschliessen. Das ist aber nicht der Fall. Gerade die von der Antragsgegnerin gewünschte Fassung kann zu Zweifeln führen. Wenn nämlich von Positivfilmen die Rede ist, die auf einem Filmband Ton- und Bildfilm enthalten, dann könnte man an das abrollende Filmband denken und infolgedessen bei getrennter Abrollung ohne weiteres annehmen, dass ein Verstoss gegen die einstweilige Verfügung nicht vorliegt. Dies ist aber, wie oben gezeigt, nicht unbedingt der Fall. Die von der Antragsg-egnerin gewünschte Fassung kommt also nicht in Frage. Ebenso erscheint es nicht zweckmässig,

diese

diese Fassung zu wählen und durch einen weiteren Zusatz am Schluss der Formel ~~aber~~ bestimmte Anordnungen zu machen, da dann die einstweilige Verfügung ~~keinen~~ kaum mehr ~~verpflich~~ verbindlich ~~tet~~ wäre ~~bliebe~~. Es muss daher bei der bisherigen Verfügung sein Bewenden haben.

Wenn die Antragsgegnerin weiter vorträgt, dass die einstweilige Verfügung bereits zu irreführenden ~~Schadens~~ Zeitungsnachrichten geführt habe, so ist nach der Überzeugung des Gerichts nicht die Fassung der einstweiligen Verfügung schuld an derartigen Missverständnissen. Liest man die einstweilige Verfügung unbefangen, dann kann man ohne weiteres erkennen, was damit gemeint ist.

Über die Kosten entscheidet § 91 ZPO.

Dr. Kuhn , Dr. Kruse , Dr. Kruse

Land gericht I — Gerichtsschreibereiabteilung ..... Geschäftsnummer: 33 Q 5

Kostenrechnung

in der Prozess- Sache Konkol-Syndikat ./. Klang

Laufende Nr.	Blatt der Akten oder Geschäftsnummer	Gegenstand des Kostenansatzes	Wert des Gegenstandes RM	Zu erheben sind überhaupt RM	Pf	Davon sind zu verrechnen als: der Staatskasse verbleibende Gelder RM	Pf	durchlaufende Gelder (Kostenregister Spalte) RM	Pf	Bemerkungen
1	2	3	4	5		6		7		8
1.		Geb. zum [illegible] 32,8	100000	580						Auftrag 14./24.
2.		Schreibgeb. 34 [illegible]								
	22	25 30		1020						" " 5,10
	8	2, 32.								
3		Porto bar.								" "
				590.28						
4	18	ab Mahn		05						V. 38700 28
				525,28						V

K. 8.
Vordruck Nr. 4a. Kostenrechnung (§ 17 Abs. 1 Kass.-Ordn.).
Buchdruckerei Reinhold Kühn A.G., Berlin SW 68.

Rechtsanwalt. 5. März 1929

Reichspatentamt. Berlin SW 61, den 2. 4. 1929
Gitschiner Straße 97-103.

Aktenzeichen: [illegible] sind bei allen Zu-
Patentnummer: 536383 schriften anzugeben

betr. Sache: Kondensator

(Geschäftszeichen) 22 G 5 29

wird um Rücksendung der Akten des Reichspatentamts:

2 — 7

ergebenst ersucht.

Anmeldeabteilung [illegible] ~~Prüfungsstelle für Klasse~~

J A

Kop.
Kop. Pat. 78a.
VII. 1927. 1000. Regierungs[illegible]

Theodor Kallmann
Rechtsanwalt und Notar
Berlin SW. 47, Yorckstr. 76
Fernsprecher: Hasenheide 2118

Fernsprecher: F. 5. Bergmann 2118

Berlin, den 12. April 1929

In Sachen

Tonbild-Syndikat ./. Klangfilm

33.Q.5.29.

1) U. v. 1/3.29 O.81 zug. 7/3.;
N.Zg.v. 19 4. Um 2-Zahl

2) Im Kosteninteresse geprüft!
Weglegen, aufzubewahren bis 19 35.
Berlin, den 13. Apr. 1929
Justiz – ober – inspektor – sekretär.

Überreiche ich ergebenst Urteil vom 1. März 29 mit Zustellungsurkunde vom 7. März 29 mit dem Antrage:

Das Rechtskraftattest erteilen zu wollen.

Der Rechtsanwalt

An das
Landgericht I
Berlin

Theodor Kallmann
Rechtsanwalt und Notar
Berlin [illegible]
Fernsprecher: F. 5. Bergmann 2118

Berlin, den 30. April 1929

In Sachen

Tonbild-Syndikat ./. Klangfilm

33. O. 5. 29.

In anbetracht, daß mir gegen [illegible] bitte ich ergebenst die Gerichtskosten abrechnen zu wollen.

Jede Partei trägt die Hälfte der Gerichtskosten.

Ich bitte um eine Abschrift der Abrechnung.

Der Rechtsanwalt

Berlin, den 1. Mai 1929

An das

Landgericht I

Berlin

16. Zivilkammer

Theodor [illegible]
Rechtsanwalt
Berlin SW. [illegible] Str. 76

Berlin, den 12. August 1929

13 C 1

In Sachen
Tonbild-Syndikat ./. Klangfilm
33. C.5. 29.

ist mit dem Antrage vom 5. Fe
1929 ein Buch
Transaktion 31
als Anlage 3 überreicht worden.
Ich bitte um Rückgabe dieses Bu
an die Büroangestellte.

Der Rechtsanwalt
gez. Kallmann
vertreten durch seinen
Generalsubstituten:
Referendar.

An das
Landgericht I
Berlin
16. Zivilkammer

1137

Bescheinigung

In Sachen

Tonbild-Syndikat ./. Klangfilm

33. Q. 5. 29.

Ich bestätige den Empfang des Buches

Transaktion 31.

Berlin, den 13. August 1929

Empfangen
Dr. 15. 8. 29
Kirsch

Wilhelm Hecht
als Prozeßbevollmächtigter der
Deutschen Welle

Landgericht
Tobian, Justizobersekretär
als Urkundsbeamter der Geschäftsstelle
des Landgerichts I.

Vorgehende Unterschrift des Justizsekretär Tobian als Urkundsbeamter der Geschäftsstelle Abteilung 33 des Landgerichts I Berlin wird mit dem Bemerken beglaubigt, daß derselbe zur Aufnahme von Urkunden befugt ist.

Berlin, den 19. November 1932.
Der Präsident des Landgerichts I.
Fabian

80 RM Beglaub. Geb. bezahlt.
Berlin d. 19. NOV. 32.
Geschäftsstelle d. G. I.
Verwaltungsabt.
Frommert,
Justizinspektor

III/2838

German Reich, City of Berlin,
Consulate General of the United States of America. } ss:

I, JOHN F. STONE, Vice Consul of the United States of America at Berlin, Germany, duly commissioned and qualified, do hereby certify that ~~[illegible]~~ Sollmann, whose true signature and official seal are, respectively, subscribed and affixed to the foregoing instrument, was at the time of subscribing the same ~~[illegible]~~ of the Prussian Landgericht I, at Berlin, German Reich, duly commissioned and by law authorized to execute such acts, and that his signature and official seal affixed thereto are genuine, and as such are entitled to full faith and credit.

IN WITNESS WHEREOF I have hereunto set my hand and the seal of the Consulate General at Berlin, Germany, this 22nd day of ~~[illegible]~~ 1932.

John F. Stone
Vice Consul of the United States of America.

SERVICE No. 06925

$2.50 RM 8.40

3418

Defendant's Exhibit S.

Theodor Kallmann
Attorney at Law and Notary
Berlin, SW. 47, Yorckstrasse 75
Telephone: Hasenheide 2118

Berlin, February 6, 1929

To State (Superior) Court I
16th Civil Chamber
Berlin

3419

In the Matter of:

Tonbild Syndikat Aktien Ges.

vs.

Klangfilm G. m. b. H.

I respectfully transmit the annexed motion for issuance of a preliminary injunction and request, in view of the fact that the tone-picture film presentation which is objected to is to take place, as has been attested, on Friday, the 8th inst. at 12 o'clock, the speediest decision on this motion.

3420

For service by the bailiff I shall require a time of one hour.

The attorney:
(Sd.) Kallmann

(Notations)

ORDER

With omission of formal phraseology, it is ordered by way of preliminary injunction, with-

Defendant's Exhibit 8. 3421

out oral hearing, in accordance with §§ 936 ff. of the Code of Civil Procedure:

(1) The defendant is * * * (wording of motion indicated by square brackets on pages 6 to 7 of the papers).

(2) The defendant shall bear the costs of the proceeding.

(3) The value involved in the litigation amounts to 10,000 RM. 3422

Berlin, February 8, 1929
State (Superior) Court I, Civil Chamber 16

(Sd.) Dr. Schumann, Dr. Heyne, Dr. Pfeifer

33.Q.5.29

Order received. I waive formal service.

3423

Berlin, February 8, 1929.

(Signature)

3424 *Defendant's Exhibit S.*

Theodor Kallmann
Attorney-at-Law and Notary
Berlin, SW. 47, Yorckstrasse 75
Telephone: Hasenheide 2118
New Telephone No.: F. 5 Bergmann 2118

Berlin, February 5, 1929.

To State (Superior) Court I
16th Civil Chamber
Berlin

3425

MOTION

For the granting of a preliminary injunction to the Tonbild-Syndikat Aktien-Gesellschaft, of Berlin, Jägerstrasse 6, represented by its Board of Directors, Dr. Hans Henkel and Arthur Frischknecht,

Petitioner,

Counsel: Attorney-at-law. Th. Kallmann, of Berlin SW 47, Yorkstrasse 76,

3426

vs.

the Klangfilm G. m. b. H., of Berlin, Askanischer Platz 4, represented by its business managers Dr. Kirn and Dr. Ackemann,

Defendant.

I.

The plaintiff is a corporation which has been formed on the basis of a merger of the former Triergon-Aktiengesellschaft, the Deutsche Ton-

 3427

film-Aktiengesellschaft, the Küchenmeister group and the Mester group, in short, of all authoritative concerns in Germany which have for years been engaged in the creation of tone films.

There have, therefore, been vested in the plaintiff concern at the time of its establishment all essential German patents and protection rights or the exclusive license thereto, for the field of the tone-picture film.

The capital stock of the petitioner amounts to 12 millions.

3428 The defendant was established several weeks ago.

II.

The petitioner is the owner of the exclusive license to German patent 368,383 (Annex 1).

A copy of the agreement and an affirmation in lieu of oath regarding the exclusive license are enclosed in Annex 2.

Patent claim 1, on which the following motion is based, reads as follows:

3429 "Process for the production of positive films which contain series of pictures and photographically recorded tone record, characterized by the fact that the negatives are developed separately."

The specification of the patent is so readily intelligible that for the sake of avoidance of repetitions it will suffice to refer to it.

III.

The defendant was established only a few weeks ago, to be sure, but is manifestly endeav-

3430 *Defendant's Exhibit S.*

oring to deprive the petitioner of its business in Germany as rapidly as possible. It is probably well known to the Court that the creation of the tone-picture film in Germany is just coming into existence and that considerable sums, amounting to millions, have already been expended in the past by the interested parties which have merged to form the plaintiff company, sums, which are only now to attain an economically serviceable fruition.

3431 A disturbance of this branch of industry which is just in course of development would accordingly find the petitioner extremely sensitive precisely at the present stage.

The defendant has announced to a considerable number of interested parties that on Friday, February 8 of this year and on the subsequent days it will present tone-picture films. It has informed these interested parties that these tone-picture films which it is the intention to present will be in particular those of the General Electric Company (Photophone films).

3432 This is attested by the affirmation in lieu of oath of the confidential clerk, Dr. Hans Böhm.

These Photophone films of the General Electric Company are, however, produced by the process of the plaintiff's patent No. 368,383, *i. e.* the negatives have been developed separately.

This is attested by the volume, submitted herewith, of Transactions of the Society of Motion Picture Engineers, page 87.

In this volume the manufacture of the films according to the process of the General Electric Co. has been described. It is immediately evident that the process here described corre-

3433

sponds word for word to the process patented in Germany.

For the sake of proper procedure there is annexed hereto a complete translation of page 87, so that the Court may have the possibility of verification without further ado.

Accordingly the products which are being produced in the United States by this process represent an infringement of German patent No. 368,383 as soon as they cross the German border.

3434

IV.

The petitioner objects to the defendant's action in now presenting American patent-infringing products to the interested parties, who in the present field represent the same group, in order to obtain publicity for the defendant and to influence its list of customers, which is also that of the petitioner, to the latter's detriment.

The petitioner is satisfied to restrict the following motion to the contents of the patent. To be sure, it is the intention to hit not only the 3435
American films of the General-Electric Company, if the latter are presented here in Germany by the defendant, but also such films as the defendant may have produced in Germany by this means, that tone negatives and picture negatives are developed separately.

V.

The urgency is self-evident in view of the situation set forth above It is probably a mat-

3436 *Defendant's Exhibit S.*

ter of judicial knowledge that this entire branch of industry is in course of development.

Nor would the petitioner be able to prove subsequently which interested parties had been lost to it as a result of the illegal presentations of the defendant. It must therefore take precautions that this damage, which cannot be recouped subsequently, shall be avoided in advance.

In view of the fact that the presentation is to
3437 take place as early as Friday of this week, it is requested that the decision be reached without an oral hearing with sufficient promptness that it can still be served upon the defendant.

The petitioner does not intend by any means to prevent, with the following motion, the presentation of tone-picture films which have been developed in some other manner than by the process of manufacture described in Patent 368,383.

VI.

3438

As attorney for the petitioner I accordingly move:

> The defendant is forbidden, under penalty of a fine of unlimited amount, to be fixed by the Court, or imprisonment for not to exceed six months for each case of infraction, to employ within the territory of Germany a process for the manufacture of positive films which contain series of pictures and a photographically recorded tone record, which process is characterized by the fact

Defendant's Exhibit S. 3439

that the negatives are developed separately, and to offer for sale, present or use the films produced by such a process.

In view of the urgency and importance of preliminary adjustment I declare the value involved in litigation, in accordance with my instructions, to be 100,000 marks.

The attorney
(Sd.) KALLMAN.

3440

LIST OF ANNEXES.

1. Patent No. 368,383.
2. Affirmation in lieu of oath by Mr. Ehrenhaft, Dipl. Eng.
3. Volume of Transactions.
4. German translation of page 87.
5. Affirmation in lieu of oath by Kallina.
6. Power of attorney for the lawsuit.
7. Affirmation in lieu of oath by Dr. Böhm. 3441

I request that any tax stamp that may be required be charged with the Court Costs.

POWER OF ATTORNEY FOR LAWSUIT

We hereby grant to the attorney-at-law Th. Kallmann, of Berlin, Yorkstrasse 76, power of attorney for prosecution of the litigation to be brought before State (Superior) Court I in

3442 *Defendant's Exhibit S.*

Berlin by us as plaintiffs against Klangfilm G. m. b. H. as defendants, for the principal action and a preliminary injunction, with the special authorization:

1. To represent us in the proceedings arising from compulsory execution, particularly in conformity with §§ 731, 767, 768, 771, 785, 805, 878 of the Code of Civil Procedure, as well as in the proceeding with a view to initiation of bankruptcy as to the property of the opposing par-
3443 ty, in the bankruptcy itself, and in the litigation arising from the bankruptcy proceeding;

2. To grant an extension of time to the opposing party if responsible for payment;

3. To receive from the opposing party and from the bankrupt estate the object of the litigation itself, even if the latter is at the place of deposit;

4. To furnish and to accept statements of charges for (us);

3444 5. To destroy, six months after legally valid decision of the lawsuit, the reference files which have not been called for;

6. To charge for the copies prepared on demand, in addition to the lump sum for expenses provided for by §76 of the Regulation relating to fees.

Berlin, February 6, 1929

Tonbild-Syndikat
Aktiengesellschaft
(Sd.) Arthur Frischknecht, H. Henkel.

Defendant's Exhibit S. 3445

AFFIRMATION IN LIEU OF OATH

I am the manager of the patent division of the Tonbild-Syndikat-Aktiengesellschaft, of Berlin, Jägerstrasse 6.

I know from personal knowledge that by the agreement of August 30, 1928 the exclusive general license for patent No. 368,383 was granted to the Tonbild-Syndikat-A. G. (Tobis). In the agreement it is stated, word for word, that there is accorded to the Tobis "an exclusive 3446
general license, unrestricted as to time, place, quality or quantity" to the rights which constitute the object of the agreement.

Among the countries there are then excepted the United States of America, Canada, Mexico and the North American Colonies.

In § 2 of the agreement it is further stated, word for word: "Tobis shall have the right, within the scope of the general license, to exercise, positively and in defense, in its own name and at its own expense, all patent rights."

3447

I affim the above in lieu of oath:

Berlin, February 6, 1929.
(Sd.) Jarruz (?) Ehrenhaft

AFFIRMATION IN LIEU OF OATH

I affirm the following in lieu of oath:

I am confidential clerk of the Tonbild-Syndikat-Aktiengesellschaft.

3448 *Defendant's Exhibit S.*

In the course of the last few days several film experts have informed me that in the Universum Motion Picture Theatre at Lehniner Platz presentations in which tone picture films were shown have repeatedly taken place on the part of the Klangfilm G. m. b. H.

The men of the Klangfilm G. m. b. H. had stated, it was said, that among other things there were involved, in particular, tone-picture films which had been produced by the American
3449 process of the R. C. A. Photophones (General Electric Company).

The General Electric process is described in the volume Transactions of the Society of Motion Picture Engineers, volume XII, no. 33, of April, 1928, on page 87.

At the moment I should prefer not to mention the names of these informants, because they are also in business relations with us and because under certain circumstances this might prove detrimental to my own concern.

Berlin, February 6, 1929
3450 (Sd.) Dr. Hans Böhm

INVITATION.

The Klangfilm G. m. b. H. of Berlin has the honor to invite you to the presentation which is to take place on Friday, February 8, 1929 at 12 o'clock noon in the

Ufa-Theatre Universum, Lehniner-Platz

There will be produced: tone-picture films, picture films with synchronized musical accompani-

ment, as well as sound-review and review of the week, furthermore, specimens of overtures and intervening music.

Berlin, SW. 11, Askanisher-Platz 4
Klangfilm G. m. b. H.

I herewith affirm, in lieu of oath, that the above transcript was copied by me verbatim.

Berlin, February 6, 1929.

(Sd.) Marg. Kallina

3452

TRANSLATION.

Of Page 87 of "Motion Pictures with Sound—Marvin."

The experience of the General Electric Company in the development of high quality loudspeakers had been utilized and it is believed that the present form represents the best obtainable at the present time. Reverberation in the room in which the sound is reproduced may, of course, affect the results and should be treated 3453
in each individual installation.

Another form of disturbance, while it is not properly called distortion, should be mentioned. This is the presence of extraneous noises, such as sprocket hum, mechanical vibration noises, radio interference, etc.

The major points in the problem of development of the system have been outlined. No attempt will be made here to discuss in detail the solution of the above problems. A fairly comprehensive knowledge of the characteristics of the process has been obtained in the laboratory

3454 *Defendant's Exhibit S.*

and steady progress is being made toward the complete elimination of the faults. Thus the thirty years handicap confronting those who are working on the addition of sounds to the motion picture is being overcome.

The system which is to be demonstrated may be outlined as follows: pictures made with a standard camera driven at constant speed result in a picture negative of the same size as in the present art. The sound negative is photo-
3455 graphed on a separate positive film moving in synchronism with the camera film. The two films are separately developed each to its own proper density, then combined in a printing machine to produce a combination print on a single film. The shape of the picture positive is maintained but the size is made slightly smaller to accommodate the sound record.

Theodor Kallmann
Attorney-at-Law and Notary
Berlin, SW. 47, Yorckstrasse 75
3456 Telephone: Hasenheide 2118
New Telephone No.: F. 5. Bergmann 2118

Berlin, February 8, 1929.

To State (Superior) I
16th Civil Chamber, Berlin

Very Urgent!

In the matter of:
Tonbild-Syndikat A. G.

vs.

Klangfilm G. m. b. H.

I submit the original of a letter of the firm of S. Klein (Logos Film) to my party.

Defendant's Exhibit S.

The contents of this letter show very unequivocally that the Klangfilm G. m. b. H. offers the manufacture of tone picture films which have been developed in accordance with the petitioner's patent, No. 368,383.

The Attorney:
(Sd.) Kallmann

3458

S. Klein
Logos, Kultur und Spielfilm G. m. b. H.
SW. 48, Friedrichstrasse 236

Berlin, February 7, 1929
Nürnbergerstrasse 6

Tonbild-Syndikat Aktiengesellschaft
Berlin W. 8,
Jägerstrasse, 6.

3459

With reference to the negotiations carried on with you some time ago with regard to the manufacture of advertising films, you promised to notify me in case of the possibility of production. In the meantime I have learned that your production has already progressed to such a point that our negotiations can be put into more concrete shape. I therefore request you to inform me whether I can count on the production of films within a reasonable time.

Since I have not heard from you for a long time, I have also communicated with the Klangfilm G. m. b. H. and I shall, of course, also enlist this system in competition in carrying out my

3460 *Defendant's Exhibit S.*

program. What is in any case decisive for me is the question by which system the cost of production is lower. As I was told at the Klangfilm Gesellschaft, it is necessary to figure on double the expense in case of recording by their system, because the recording of the tones and of the pictures is effected upon separate films which have to be developed separately and can be copied upon a common positive film only subsequently.

3461 I now ask you whether this double expense arises in your recording process also. For me it would naturally be of great importance if, for reasons of economy, the recordings could be made at once upon a common film and if the latter could then be multiplied in an ordinary copying machine. Please be so kind as to inform me on this point and at the same time also please quote me your prices for reproducing instruments, which must be as portable as possible. Kindly inform me also whether you are now in a position to supply me with a recording apparatus or on what terms you could place one at my

3462 disposal temporarily.

In expectation of an early reply from you, I beg to remain

Respectfully yours,

(Sd.) S. KLEIN

Defendant's Exhibit S. 3463

L. G. 29

State (Superior Court I, Berlin)

File No.: 33.Q.5.29

Computation of Costs

In the matter of Tonbild-Syndikat vs. Klangfilm.

Serial No.	Sheet of the Record	Object of the Charge of Costs	Value of the Object RM.	Total to be Collected RM. Rpf.	Remarks
1		Fee for the proceeding § 32, No. 1 of the Law relating to Court Costs	10,000	65 —	The defendant is responsible after service
2		Postage herefor		0 08	
			Total	65.08	

3464

Debtor: Berlin, February 11, 1929 3465
The Petitioner (Sd.) Meyer
Judicial Inspector

3466 *Defendant's Exhibit S.*

Attorneys-at-Law and Notaries
Dr. Danziger
Dr. Nunninghoff
Berlin W 10

Margeretenstrasse 8
Tel.: Nollendorf 1596/97

Berlin, February 15, 1929

Very Urgent!

3467 To State (Superior) Court 1
Berlin

In the matter of:
Tonbild vs. Klangfilm
33.Q.5.29

We submit enclosed herewith an opposition and summons.

In view of the fact that the preliminary injunction was granted by the Court in the course of a few hours without oral hearing, it is prob-
3468 ably a dictate of compensatory justice that, in view of the effects of the preliminary injunction, it is necessary to set the date for a hearing on the opposition as early as possible.

It is requested that the date of hearing be set for the next trial day, the 19th inst., and that the time of summons be shortened to 24 hours.

(Sd.) Dr. Nunninghoff
Attorney-at-Law

Defendant's Exhibit S. 3469

Court Copy

Attorney-at-Law and Notaries
Dr. Danziger
Dr. Nunninghoff
Berlin W 10
Margaretenstrasse 8
Tel.: Nollendorf 1596/97

Time of Service, 24 hours
Date of Hearing; Feb. 22, 1929, 12 o'clock in the Court House in the Grunerstrasse, 2nd Floor Rooms 16-18. 3470
Berlin, February 15, 1929
State (Superior) Court 1, 16th Civil Chamber
The presiding justice
(Sd.) Dr. Sch.

Berlin, February 14, 1929.

To State (Superior) Court 1 Berlin

Objection

In the matter of the Tonbild-Syndikat Atkiengesellschaft, of Berlin, Jägerstrasse 6, presented by its Board of Directors Dr. Hans Henkel and Dr. Arthur Frischknecht 3471

Counsel: Attorney-at-law Th. Kallmann, Berlin SW 47, Yorkstrasse 76—

vs.

The Klangfilm G.m.b.H., of Berlin, Askanischer Platz 4, represented by its business managers Dr. Kirn and Dr. Akemann.

— 33.Q.5.29 —

We submit herewith power of attorney of the defendant and we file an objection to the order

3472 *Defendant's Exhibit S.*

of February 8, 1929 of State (Superior) Court 1, Berlin, with the motion.

> That the preliminary injunction of February 8, 1929 be set aside to this extent that the words "upon *one* film strip" be inserted after the word "which".

For an oral hearing on this objection we summon the petitioner before the court to which it has applied, through its counsel, attorney-at-law Th. Kallmann, Berlin SW 47, Yorckstrasse 76,
3473 on the date to be set by the presiding justice, with the demand that any objections and evidence be communicated to the Court and to the undersigned counsel in a pleading.

Statement of Grounds

The present objection is at the moment directed against the preliminary injunction only insofar as is expressed in the above motion.

If one reads the motion for February 5, 1929 and the annexed translation of page 87 of Motion Pictures, one at first gets the impression
3474 that the motion is directed against a process of manufacture in which the tone film and the picture film are developed separately but a combined positive is then produced from both of them upon a single film.

At the end of IV of the statement of grounds of the motion there occurs the first obscurity, inasmuch as it is there stated that the motion is intended to be directed also against films which may possibly be manufactured by the defendant in Germany and in which the tone negative and the picture negative are developed separately. Here there is lacking the characteristic feature

Defendant's Exhibit S. 3475

of the union of the separately developed films upon *one* film.

The distinctive feature is likewise lacking in the motion. And it is also lacking in the order which had been granted.

The films which the defendant has manufactured in Germany are produced in this way, that the tone and picture are always situated upon separate film strips. The recording of the tone and of the picture is effected upon separate picture strips, the development is effected upon separate picture strips and the production of the 3476
positives is effected upon separate picture strips. In the reproduction the tone and the picture are unreeled from separate picture strips.

That this does not come under Patent 638,383 requires no detailed explanation. But the wording of the preliminary injunction, whether it is so intended or not, goes further and in response to an explicit inquiry by letter as to whether the petitioner does not derive any rights from the preliminary injunction insofar as the tone and the picture unreel from *separate* film strips in 3477
the reproduction, the giving of a reply was declined.

The defendant is not a concern of the kind which it has been the endeavor to characterize in the motion of the other side, but is a very serious industrial concern whose responsible heads must have an assurance that the process described, which has hitherto been employed by them in the manufacture of picture tone films, is not affected by the preliminary injunction.

(Sd.) Dr. Danziger
Attorney-at-Law

3478 *Defendant's Exhibit S.*

I request that any tax stamp that may be required be charged with the Court costs.

Power of Attorney for Lawsuit

We hereby grant to the attorneys-at-law and notaries Dr. Georg Jac. Danziger, Dr. Richard Nünninghoff, of Berlin W. 10, Margaretenstrasse 8, power of attorney for prosecution of the litigation brought before State (Superior) Court 1 in Berlin, File No. 33.Q.5.29, by the Tonbild-Syndikat Akt.-Ges., of Berlin, Jägerstrasse 6, as
3479 petitioner, against us as defendants, for a preliminary injunction, with the special authorization:

1. To represent us in the proceedings arising from compulsory execution, particularly in conformity with §§ 731, 727, 768, 771, 785, 805, 878 of the Code of Civil Procedure, as well as in the proceeding with a view to initiation of bankruptcy as to the property of the opposing party, in the bankruptcy itself, and in the litigation arising from the bankruptcy proceeding;

3480 2. To grant an extension of time to the opposing party if responsible for payment;

3. To receive from the opposing party and from the bankrupt estate the object of the litigation itself, even if the latter is at the place of deposit;

4. To furnish and to accept statements of charges for us;

5. To destroy, six months after legally valid decision of the lawsuit, the reference files which have not been called for;

Defendant's Exhibit S. 3481

6. For all demands of fees arising from this matter there shall have jurisdiction . . . court . . . at . . .

Several holders of power of attorney are authorized to act as representatives individually and collectively.

Berlin, February 14, 1929

(Sd.) Klangfilm Gesellschaft mit beschränkter Haftung 3482
Kirn Akemann

National Patent Office

File No.: V.16437 IX/57a²
Patent No.: 368,383

Berlin SW. 61, Feb. 20, 1929
Gitshiner Strasse 97-103

3483

To State (Superior) Court 1
Neue Friedrichstrasse 16-17
Berlin C. 2

Re Tonbild-Syndikat vs. Klangfilm
(File No.) 33.Q.5.29

In response to the letter of February 5, 1929 there is enclosed herewith the file wrapper of Patent 368,383, with the request for return after use has been made thereof.

In case the matter reaches a conclusion through a decision, it is requested that a transcript there-

3484 *Defendant's Exhibit S.*

of be supplied after it becomes legally effective, together with the record of the judicial proceeding.

Application Division IX
By Authority
(Sd.) Government Inspector

By Messenger
In return for receipt

3485

Public Session of State (Superior) Court I
16th Civil Chamber

Berlin, February 22, 1929

Present:

1. Justizrat Dr. Hamburger
As Presiding Justice,

2. District and State Judge Kopf,

3. Judicial Assessor Dr. Knapp
3486 As Associate Justices,

The Court Official Zeiss
As Document Clerk of the Clerk's Office

In the matter of:
Tonbild vs. Klangfilm

there appeared, when the case was called:

1. For the Petitioner, attorney-at-law Kallmann, together with attorney-at-law Meltau, Dipl. Eng. Ehrenhaft, and attorney-at-law Prof. Dr. Isay.

Defendant's Exhibit S. 3487

2. For the Defendant, attorney-at-law Dr. Danziger and Privy Councillor Prof. Dr. Nernst.

The attorney for the petitioner read aloud the motion of the pleading of February 22, 1929.

The attorney for the defendant read aloud the motion of the pleading of February 14, 1929, sheet 20 of the record.

The attorneys then argued the case.

1. After the parties were heard, the value involved in the litigation was, in modification of 3488
the order of February 8, 1929, fixed differently at 100,000 RM.

2. Date set for decision, March 1, 1929, 12 o'clock.

(Sd.) Dr. Hamburger Zeiss

Drawn up February 25, 1929. Hösler
6 long transcripts of the decision, = 8 pages each.
2 Brief " "
3489

33.Q.5.29.

3490 *Defendant's Exhibit S.*

Theodor Kallmann
Attorney-at-Law and Notary
Berlin, SW. 47, Yorckstrasse 75
Telephone: Hasenheide 2118

Berlin, February 22, 1929.

To State (Superior) Court I
Berlin

In the matter of:
Tonbild vs. Klangfilm
3491 - 33.Q.25.29. -

I make the motion that the objection of the defendant be dismissed and that the order of February 8, of the present year, be confirmed.

The Attorney:
(Sd.) Kallmann

Verified for the purpose of service.
Berlin, February 22, 1929.
The Attorney:
3492 (Sd.) Kallmann

Theodor Kallmann
Attorney-at-Law and Notary
Berlin, SW. 47, Yorckstrasse 75
Telephone: Bergmann 2118

Berlin, February 22, 1929

Pleading

In the matter of: The Tonbild-Syndikat Aktiengesellschaft of Berlin, Jägerstrasse 6, represent-

 3493

ed by its Board of Directors, Dr. Hans Henkel and Arthur Frischknecht.

Counsel: Attorney-at-law Th. Kallmann, of Berlin SW. Yorckstrasse 76

vs.

the Klangfilm G. m. b. H., of Berlin, Askanischer Platz No. 4, represented by its business managers D. Kirn and Dr. Akemann.

3494

The motion for dismissal of the objection of the defendant is justified as follows:

1. The Order of the State (Superior) Court adheres word for word to patent claim 1. In the present case this could be done without any deviation, because the concrete situation is thereby correctly dealt with at the same time. This is proved by the publication in "Motion Pictures with Sound, Marvin", page 87.

2. It is, however, not necessary either, to in- 3495
sert the words "upon one film strip" in the Order, because at best an obscurity is introduced thereby.

In the Order of February 8, 1929 and likewise in patent claim 1 there is the explicit characterization that what is involved is positive films "which contain series of pictures *and* photographically recorded film record."

That distinctly expresses the idea that the positive films are to contain *both* the picture series *and* the tone series. If such were not the case there would have to be an "or" instead of an "and".

3496 *Defendant's Exhibit S.*

The Patent Office probably cannot be criticized on the ground that it does not proceed with sufficient care in the wording of patent claims.

3. By the insertion of the words "on one film strip" there is further produced the additional danger of obscurity due to the implication that the defendant was evading the patent by subsequently cutting up the unitary positive film produced according to the patent and was reproducing the two partial strips in synchronized form.

3497 A further obscurity would likewise be created on the occasion of the ordinary reproducing process in which several positive films are pasted to one another in succession (i. e. lengthwise), so that one film strip is no longer present.

The order of February 8, 1929 is properly formulated and requires no completion or correction.

The attorney:
(Sd.) Kallmann

3498 *Receipt*

In the matter of:
Tonbild vs. Klangfilm

File No.: 33.Q.5.29 7.1/3

I have duly received the file wrapper of patent 368,383.

Berlin, February 26, 1929
(Signature)

Received back.
February 28, 1929.
Z.

Defendant's Exhibit S. 3499

Public Session of State (Superior) Court I
16th Civil Chamber

Berlin, March 1, 1929

Present:

1. Justizrat Dr. Hamburger
as Presiding Justice,

2. Court Assessor Dr. Pfeifer

3. Court Assessor Dr. Knapp
as Associate Justices,

The Court Official Zeiss 3500
as Document Clerk of the Clerk's Office
of State (Superior) Court I.

In the matter of:
Tonbild-Syndikat vs. Klangfilm.

There appeared, when the case was called, nobody.
The annexed decision was handed down.

(Sd.) Dr. Hamburger

Zeiss

Wording of the decision by Justizrat Dr. Hamburger 3501

33.Q.5.29/5

(The following sheet contains manuscript notations regarding transcripts of the record.)

(The following 8 pages contain the decision confirming the preliminary injunction of February 8, 1929. A translation of this decision forms a part of Plaintiff's Exhibit 34.)

3502 *Defendant's Exhibit S.*

(The following sheet contains the computation of Court costs.)

National Patent Office

File No.: V.16,431 IX/57a²
Patent No.: 368,383
Must be given on all communications.

Berlin SW. 61, April 8, 1929
Gitschiner Strasse 97-103

3503 Re: Tonbild-Syndikat vs. Klangfilm

File No.: 33.Q.5.29

The return of the files of the National Patent Office is hereby requested.

Application Division IX
By Authority
(Signature)
Government Inspector.

Theodor Kallmann
3504 Attorney-at-Law and Notary
Berlin, SW. 47, Yorckstrasse 75
Telephone: Hasenheide 2118
New Telephone No.: F. 5. Bergmann 2118

Berlin, April 12, 1923

To State (Superior) Court I
Berlin

In the matter of:
Tonbild-Syndikat vs. Klangfilm
33.Q.5.29

I respectfully submit the decision of March 1, 1929 with certificate of service of March 7, 1929,

3505

with the motion that the attestation of legal validity be issued.

The attorney:
(Sd.) Kallmann

(Notation)

1. Decision of March 1, 1929; served March 7; etc.

2. Examined with a view to costs.
To be filed and preserved until 1935. 3506
Berlin, April 13, 1929.
(Signature)
Judicial Inspector.

Theodor Kallmann
Attorney-at-Law and Notary
Berlin, SW. 47, Yorckstrasse 75
Telephone: Hasenheide 2118
New Telephone No.: F. 5. Bergmann 2118

3507

Berlin, April 30, 1929

To State (Superior) Court I
16th Civil Chamber
Berlin

In the matter of:
Tonbild-Syndikat vs. Klangfilm
33.Q.5.29

I request that the court costs be computed.
Each party is to bear one-half of the court costs.

3508 *Defendant's Exhibit S.*

I request a transcript of the computation.

The attorney:
(Sd.) Kallmann

(Notation)

Reply that altogether 65.08 RM. has been demanded from the petitioner and 525.28 RM. in Court costs from the defendant.

Berlin, May 1, 1929

3509 (Sd.) Müller

Theodor Kallmann
Attorney-at-Law and Notary
Berlin, SW. 47, Yorckstrasse 75

Berlin, August 10, 1929

To State (Superior) Court I
16th Civil Chamber
Berlin

In the matter of:
Tonbild-Syndikat vs. Klangfilm
3510 33.Q.5.29

With the motion of February 5, 1929 a book

Transaction 31

was submitted as Annex 3.

I request the return of this book to the clerical employee.

The attorney
(Sd.) Kallmann
Represented by his general substitute
(Sd.) Dr. Wilhelm . . .

Defendant's Exhibit S. 3511

Certificate

In the matter of:
Tonbild-Syndikat v. Klangfilm
33.Q.5.29

I acknowledge receipt of the volume

Transaction 31

Berlin, August 13, 1929

3512

(Sd.) Dr. Wilhelm . . .
As general substitute of Attorney-at-Law
Kallmann

(Notation)

Received
Berlin, Aug. 15, 1929
(Sd.) Kirsch

3513

Authenticated

(Sd.) Tobien, Court Clerk
As Document Official of the Clerk's
Office of State (Superior) Court I

(SEAL)

The foregoing signature of Court Clerk Tobien as Document Official of the Clerk's Office, Division 33, of State (Superior) Court I in Ber-

3514 *Defendant's Exhibit S.*

lin is authenticated with the observation that he is duly authorized to issue the document.

Berlin, November 19, 1932

The President of State (Superior) Court I
(Signature)

(Seal of the President
of Prussian Superior
Court I, Berlin)

3515

Authentification fee of 80 RM. paid.

Berlin, November 19, 1932.

Clerk's Office of State (Superior) Court I.
Administration Division.
(Signature)
Judicial Inspector
1 22/2839

3516

3517

Opinion, Campbell, D. J.

UNITED STATES DISTRICT COURT,

EASTERN DISTRICT OF NEW YORK.

AMERICAN TRI-ERGON CORPORATION, Plaintiff, vs. PARAMOUNT PUBLIX CORPORATION, Defendant.	Equity 5800. August 14, 1933.

3518

WARD, CROSBY & NEAL, Solicitors for Plaintiff; S. MORTIMER WARD, JR. and PAGE S. HASELTON, of Counsel.

CHARLES NEAVE, HENRY R. ASHTON, W. J. BARNES, F. T. WOODWARD, and E. J. DRISCOLL, Counsel for Defendant.

3519

CAMPBELL, D. J.:

Plaintiff brings this suit against the defendant for relief by injunction and damages for the alleged infringement by the defendant, at its studio in Long Island City, of patent No. 1,825,598, issued to Vogt, Massolle and Engl, by mesne assignments to the plaintiff, for Process of Producing Combined Sound and Picture Films, granted September 29, 1931, on application filed March 29, 1922, corresponding to German Application No. V. 16431 VI/57 a2, filed April 14, 1921. This has been held by the Patent Office to be the

3520 *Opinion, Campbell, D. J.*

effective date under the International Convention.

No evidence was offered showing any commercial activity of the plaintiff, or of any one operating under license from it.

The defendant is a well known motion picture producer.

This suit is being defended by Electrical Research Products, Inc., the wholly owned subsidiary of the Western Electric Company, formed to take over the commercial distribution of the
3521 Western Electric talking motion picture sound recording and reproducing systems which were developed by the research laboratories of the Western Electric and American Telephone & Telegraph Companies.

The defendant is licensed by the Research Products, Inc. to record for talking pictures by means of the Western Electric system, and has from the beginning used that system and apparatus.

The defendant has by answer interposed the
3522 defenses of invalidity and non-infringement.

This suit is based on claims 5 to 9, both inclusive, and claim 11 of the patent in suit, but claims 6 and 7 are to be read with the Disclaimer, filed November 23, 1932.

Said claims and disclaimer read as follows:

> "5. A process for producing a combined sound and picture positive film, for talking moving pictures, comprising, photographing a sequence of pictures on one length of film, and simultaneously photographing on another length of film a corresponding sequence of sounds accompanying the action, separate-

ly developing the two negatives in a manner appropriate for each, and printing the sound and picture negative respectively upon different longitudinally extending portions of the same sensitized film, to form the sound sequence at one side of and along the picture sequence.

6. A process for producing a combined sound and picture positive film, for talking moving pictures, comprising, photographing a sequence of pictures on one length of film, 3524 and simultaneously photographing on another length of film a corresponding sequence of sounds accompanying the action, so that the picture and sound negatives may be separately developed in a manner appropriate for each, and printing the sound and picture negatives respectively upon different longitudinally extending portions of the same sensitized film, to form the sound sequence at one side of and along the picture sequence.

7. A process for producing a combined 3525 sound and picture positive film, for talking moving pictures, comprising, photographing a sequence of pictures on one length of film, and simultaneously photographing on another length of film a corresponding sequence of sounds accompanying the action, so that the picture and sound negatives may be separately developed in a manner appropriate for each, and printing the sound and picture negatives respectively upon the same face of the same sensitized film at different longitudinally extending portions thereof, to form

3526 *Opinion, Campbell, D. J.*

the sound sequence at one side of and along the picture sequence.

8. The method of producing a talking moving picture record on a single film which comprises photographing simultaneously upon separate films the picture and the sound to form separate negatives, photographing said negative picture record upon a portion of a sensitized film not exposed to a sound record, and photographing the negative
3527 sound record on the same face of said last film and at a portion thereof not exposed to the picture record.

9. The method of producing a talking moving picture record on a single film which comprises photographing simultaneously upon separate films the picture and the sound to form separate negatives, photographing said negative picture record upon a portion of a sensitized film not exposed to a sound record, and photographing the negative
3528 sound record on the same face of said last film and at a portion thereof not exposed to the picture record, said last two photographing steps being performed consecutively."

"11. A process for producing a combined sound and picture postive film, for talking moving pictures, comprising, photographing a sequence of pictures on one length of film, and simultaneously photographing on another length of film a corresponding sequence of sounds accompanying the action, separately developing the records of said two

lengths of film in a manner appropriate for each, and printing such developed sound and picture records respectively upon different longitudinally extending portions of a single sensitized film, to form the sound sequence at one side of and along the picture sequence."

"DISCLAIMER

To the Hon. Commissioner of Patents:

Your petitioner, American Tri-Ergon Corporation, a corporation organized and existing under the laws of the State of New York and having a place of business in the City, County and State of New York, represents that in the matter of certain improvements in Process for Producing Combined Sound and Picture Films, for which Letters Patent of the United States No. 1,825,598 were granted on September 29, 1931 to said American Tri-Ergon Corporation, as assignee by mesne assignments of the inventors, Hans Vogt, Joseph Massolle and Josef Engl, said corporation is the owner of the entire right, title and interest under an assignment dated June 6, 1930 and recorded in the Transfers of Patents of the United States Patent Office, July 3, 1930, Liber T 144, pages 192 to 199, and other assignments referred to in said assignment, and that your petitioner has reason to believe that through inadvertence and without any fraudulent or deceptive intention, the specification and claim of said

3532 *Opinion, Campbell, D. J.*

Letters Patent are too broad, including that of which said inventors were not the first inventors. Your petitioner therefore hereby enters this disclaimer to that part of the claim which it does not choose to claim or hold by virtue of the patent or said assignments, to wit:

(a) The process as set forth in claim 6, except wherein the picture and sound negatives are separate films at the time of development.

3533

(b) The process as set forth in claim 7, except wherein the sequence of pictures is photographed upon a film separate from that upon which the sequence of sounds is photographed, and the picture and sound negatives are separately developed, in a manner appropriate for each, and are consecutively printed upon the same sensitized film."

3534 More than nine years elapsed between the date of the filing of the application in question in the United States Patent Office and the date of the granting of the patent in suit and the claims in suit were introduced by amendment dated July 15, 1931.

During that long period of time the defendant and the Western Electric, its parent company, engaged extensively in the commercial distribution of said Western Electric talking motion picture sound recording and reproducing systems.

At the time of the application in the United States Patent Office for the patent in suit in 1932, it was common and necessary practice in

the motion picture industry to compensate, so far as was possible, for over and under exposure of different scenes or takes of motion pictures by under and over development, respectively, of the picture negatives.

This was accomplished by what was known as the rack and tank development, in which each scene was wound on a rack and then submerged in a tank containing the developer, the development being watch by the operator, who from time to time lifted the rack and film from the 3536
tank, and exercising his individual judgment, determined the extent to which the development of the particular scene should be carried.

This, of course, resulted in merely a compromise, inasmuch as no amount of manipulation would make it right, if the exposure was not correct in the first place, but would merely change the degree in which it was not correct.

In recording sound photographically the negative sound record, it was realized, would be uniformally, if not correctly or normally, exposed (a uniform source of light being used) and, therefore, should receive a uniform development 3537
throughout.

To continue the practice of compensating in the developing of the pictures for under and over exposure of the pictures, the patentees wished to develop their picture records separately from their sound records.

This the patentees described in their specifications as originally filed in the United States, in 1922, as follows:

> "In the production of speaking films it is of great advantage especially from the point

3538 *Opinion, Campbell, D. J.*

of view of use, to arrange the sound sequence and the picture sequence upon one and the same material carrier (film).

"In this procedure, however, there frequently occur in consequence of the changing lighting conditions in the cinematographing process, changes in the degree of light and the bromide of silver layer, and this causes the picture sequence to be either overlighted or underlighted.

3539 "As the same film, however, bears close to the picture sequence the continuously normally lighted sound sequences, these differences cannot be removed in the case of combined negatives, by devolping, weakening, strengthening, and so forth. They can only be removed by subjecting the underlighted or the overlighted negative places to separate corresponding treatment.

"Technically, this treatment is practically impossible so long as the two sequences are photographed upon the same film."

3540 Further such original specification says:

"According to the present invention the difficulty is overcome by either employing entirely separate films for the production of the negatives, or films which are connected during the photographing, but which are separated from one another before the developing."

The difficulty which the patentees were seeking to overcome was under and over exposure of the different picture scenes, which they proposed

to do by developing the negative picture records separately from the negative sound record.

The alleged invention cannot be considered as broadly, for having the picture and sound records on different films, so that they are separately developed, as that was old and there would be no invention.

The paragraph of the specifications last quoted proposes two ways of obtaining the separate negatives, (1) to record sound and picture films on separate films in the first instance, (2) to separate the two records after recording them on the same film. This is shown on the drawings added by amendment. 3542

Fig. 1 shows sound and picture records recorded on separate films of standard width. Fig. 3 shows two negative records recorded on a wide non-standard film, having three rows of sprocket perforations, and which are severed at either p or u before development. Fig. 2 shows a wide non-standard positive print produced by printing the separate or separated negative records preferably consecutively on the same film.

The specifications states that the two negatives of Fig. 1 or the separated negatives of Fig. 3 may be united or pasted together prior to the printing and then copied "in the usual manner." 3543

In the separate film process of Fig. 1, there are three or four steps depending on whether the two records are or are not pasted together before printing, namely, (1) exposing, (2) developing, and (3) printing, and if the two records are pasted together before printing, that constitutes the fourth step.

In the divided film process of Fig. 3, which is claimed in claim 2, there are four or five steps,

3544 *Opinion, Campbell, D. J.*

depending on whether the divided or separated negatives are or are not pasted together or reunited before printing; but this process needs no further consideration as it is not in suit.

The claims in suit may be divided into two groups, namely, (1) claims 8 and 9, which are two-step claims for exposing and printing; (2) claims 5, 6, 7 and 11, which are three-step claims, the additional step being the developing, claims 6 and 7 being read with the disclaimer.

3545 The specification further states:

> "The synchronism is assured in both cases by the perforations and by corresponding marks. The production of the positive films can take place by copying the two negative films preferably consecutively upon the same positive films.
>
> "One can, however, also unite, previously, the two negative films longitudinally together, and then copy this so united negative in the usual manner."

3546 Nowhere in their said original specification or claims did the patentees state or even suggest that it was at all material that the two negatives be printed on the same side or face of the positive film.

Plaintiff's expert says that he finds it by inference which he gets from the specification, and prior practice on this point.

I cannot agree with him.

The most that the patentees in the specification say is that it is desirable to "arrange" the two records "upon one and the same material carrier (film)"; that the production of the posi-

tive films can take place by copying the two negative films preferably consecutively upon the same positive films"; and, in original claim 1, that the two records are "copied upon single film".

The idea of recording sound on film, of recording pictures on film, or both sound and pictures on the same film, of recording sound and pictures on separate films so as to be able to develop them separately and then project them together, or of printing sound and pictures from separate negatives upon a single film, were separately and collectively old prior to the conception date of either party, neither of which goes back of 1921. 3548

See Greensfelder patent No. 1,254,684, which disclosed everything but simultaneously recording; DeForest patent No. 1,446,246.

It is true that Greensfelder recorded his sound record after he took his pictures, instead of doing it at the same time.

There was, however, no novelty in simultaneous recording, as this was old. For example, see Bullis patent No. 1,335,651, and Craig patent No. 1,260,337. 3549

The plaintiff urges that defendant cannot with good grace contest patentability, in view of the application of Wente, a research engineer of the Western Electric Company, to which he assigned such application; but this contention was not sustained. Wente did make broad claims as is customary, but those broad claims were cancelled on the first amendment, and as I believe on Greensfelder rather than on the Vogt British patent. In any event, claims similar to some of the Wente claims so cancelled were made by Craig, in 1913, and cancelled as unpatentable at that time.

3550 *Opinion, Campbell, D. J.*

The claims of the patent granted to Wente are limited, and I do not see how his application prejudices the defense in this action.

The plaintiff's expert stated on cross-examination that what he thought was new in the patent in suit, and not found in the prior art, was printing both the separately exposed, separately developed negatives side by side, on the same side of the positive film.

On re-direct examination he stated that in addition to what he had previously stated was
3551 new over the prior art, was the process of simultaneously recording the sound and picture record, and in printing them side by side on different longitudinally extended portions of the same positive film, without regard to whether they are separately developed or not.

The original specifications were amended to state that the separate development step might be eliminated.

This amendment invalidated the two-step claims, as a separate development to overcome
3552 under and over exposure of the different picture scenes was the most important part of the disclosure, and by its elimination the invention claimed therein was different and broader than the one disclosed by the patentees in their application as filed.

It was old and well known in the art to have both the picture sequence and sound sequence printed side by side on a positive film, and also to put the sound record beside the picture record on a single film.

Walker patent No. 1,168,717 discloses that the picture negative and sound negative were put

on different longitudinally extending portions of the positive film at different times.

Craig patent No. 1,260,337 discloses in the negative process recording of sound negatives and picture negatives on separate films, and the two negative films developed separately and printed on opposite sides of one film.

The patentees filed their first application for the alleged invention in Germany, on April 15, 1921, and thereafter within the convention period they filed their application in the United States on March 29, 1922, and their British application 3554 on April 11, 1922, all three being substantially identical including their claims. The original claim 1 was for the two-step process of developing and printing, specifying that the two records are developed separately, but not whether made on one or two films, and then printed on a single film. Claim 2 was limited to these two steps by reference back to claim 1, and added the third step of exposing or photographing the two records on separate films. Claim 3 was limited to the two steps of claim 1 and added two additional steps, namely, the photographing on a 3555 single film, and the subsequent dividing of that film for separate development. Claim 4 refers back to the several steps of each of the three preceding claims, and adds to the several steps of each, the step of reuniting the two negatives before printing.

The application of the patentees in each of the three countries was therefore for a patent for their separate film process.

Defendant offered in evidence the file-wrappers and contents of the German Patent Office,

3556 *Opinion, Campbell, D. J.*

and the British Patent Office, but I can find no authority for their reception other than to show what was the application originally filed, and the patent that was granted.

The German patent issued to the patentees was published on February 2, 1923.

There was offered in evidence the German patent No. 279,598, of 1914, to Reimer, which specifically claimed:

3557

> "Process for the making of a film which consists of an image band and a sound band having the distinctive feature that each band is made as an individual separately, and that both hands are thereupon combined with each other."

This appears to exhaust any novelty as a process in the patentees' separate film process.

Defendant also offered in evidence the British specification offered to public inspection by the British Patent Office on April 15, 1922, four days after it was filed. This was admissible to show
3558 the application that was filed.

Defendant also offered in evidence British patent No. 178,442, as printed and placed on sale at the British Patent Office on December 7, 1922. Between April 15, 1922, the time of filing, and December 7, 1922, when the application was printed and placed on sale, the fourth paragraph of the specification was changed by substituting the following:

> "The process for the production of combined sound picture films hereinafter set forth differs from previous attempts in this

direction, chiefly in the perfect synchronization of the sound and picture sequences, whilst permitting of the separate development of the respective negatives necessitated by unavoidable variations in the lighting of the films during the initial exposure.

"Attempts have been made to attain the end in view by taking the two negatives separately and independently and subsequently combining the records for reproduction; but it is found impossible to secure full synchronization in this manner. 3560

"It has also been proposed to pass two separate films for the picture and sound records respectively, the film being driven positively and simultaneously by passing over the same sprocket wheel through a talking apparatus and to provide means for producing a series of corresponding identification marks upon the films by aid of which the two films after separate development can be reassembled; but this process also lacks the requisite accuracy of register.

"According to the present invention, the difficulty is overcome by employing films for the production of the negatives which are integral during the photographing, but which are separated from one another before developing. 3561

"After development, these two negative films are reunited and are copied upon the same positive film. In this way, the absolute coincidence of the sound and the picture record, respectively, is assured, whilst the needful difference in treatment can be given during the development."

3562 *Opinion, Campbell, D. J.*

The patent was published with only one claim, as follows:

> "Improved process for the production of combined sound and picture records, in which the sound record and the picture record are produced simultaneously on a single film, which is then divided and the two parts developed separately, and afterwards reunited and used to print the single positive record."

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This brings us to the United States application.

On April 14, 1922, the day before the British application was opened to the public, the United States Patent Office Examiner acted on the application, and cited the Bullis patent No. 1,335,-651.

On November 25, 1922, shortly before the revamped British patent was published, the patentees cancelled all the original claims of the United States application, and inserted a single
3564 claim which was identical with the single claim of the British patent, *supra.*

This action, it seems to me, must have been taken in view of the Bullis patent.

No drawing was filed with the original application, but by amendment a drawing was filed on November 25, 1922.

The defendant frequently referred to counsel's arguments and statements during the progress of the patent through the Patent Office, but these are not admissible to show estoppel, and therefore I have not considered them.

The new claims were specifically limited to the divided film process.

The actions of the patentees on their applications in Great Britain and the United States seem to me to be susceptible of only one interpretation, and that is, that they are intended to and did abandon the alleged invention covered by the claims in suit.

On April 19, 1923, after the British Patent was issued, the Examiner in the United States Patent Office rejected the single claim, stating: 3566

> "The claim is rejected as not involving invention over Bullis of record. It does not involve invention to make the record on a single film instead of on two films rigidly attached together, especially in view of the fact that the single film is afterwards cut apart as the parts of the united film are taken apart."

The patentees by amendment acquiesced in the rejection and cancelled their single process claim without reservation of any kind, and inserted 3567 in the amendment two product claims, requiring in each claim one homogeneous film band, on which the sound records and picture records are copied, the first claim being for a composite print produced from separate films, and the second claim for a composite print produced from a cut or divided single film.

The Examiner, on October 15, 1923, rejected claim 1 upon the prior Craig patent, No. 1,260,-337, which he held "shows a film on which two separate negatives are copied". He further

3568 *Opinion, Campbell, D. J.*

said, "Claims 1 and 2 are rejected as defining an article by the process of making it. In order that claims of this character may be allowed, it is necessary that the article have physical characteristics which an article made in the old way would not have. This is not true in this case."

The Examiner further said:

> "Claim 1 is required to be cancelled. In
> 3569 response to the requirement for division contained in the Office Action of April 14, 1922, applicant elected the form in which the records were made on a single film and then cut apart. He cannot now claim the species in which they are now made on two separate films."

No further action was taken for nearly a year.

In the interim plaintiff's present counsel were retained to prosecute the application which they continued during the remaining seven years.

They interviewed the Examiner and on Sep-
3570 tember 29, 1924, filed an amendment containing two process claims the obvious purpose of which, it seems to me, was to recapture the process which had been abandoned.

On January 26, 1925, the Examiner rejected both claims, citing Greensfelder patent No. 1,254,684, and also the abandoned British specification No. 157,751, filed by the patentees of the patent in suit, and corresponding to French patent No. 532,750.

The applicants on April 2, 1925, by amendment added as claims 3 and 4, claims 1 and 3 of

patent No. 1,489,314, to DeForest, which had issued a year before, and requested an interference.

On April 6, 1925, the Examiner again rejected the claims on their merits, and said:

> "Claims 1 and 2 are rejected on Craig, 1,260,337 in view of Greensfelder, 1,254,684, both of record. It is shown to be old in Craig to take separate synchronous sound and picture records simultaneously, and to then reproduce these two records on a single record strip. Applicant desires to reprint both records on one side only; but this is the teaching of Greensfelder. Note page 3, line 128, to page 4, line 8." 3572

The Examiner was the same Examiner who had granted the DeForest patent, and he further said:

> "Claims 3 and 4 are rejected as not based on the disclosure of applicant. Applicant takes a sound record and a picture record 3573 and reproduces these two records on a third film. These claims, however, call for a sound record and a picture record as does applicant, but the claims then define that the sound record is reproduced on the original picture record strip which is not the method of applicant. If, however, it requires that a positive of the sound record be made and a reprint of this be taken on the original picture strip, still it would not be the method outlined by applicant in his specification.

3574 *Opinion, Campbell, D. J.*

> The steps are clearly not the same. Referring to the case of the patentee, the reference Craig cited in this action was held not to be a reference against the claims here under consideration, and though the steps in the method of applicant and of Craig are the same, yet the claims of patentee were held patentable over Craig. Therefore, it is evident that applicant cannot make the claims of the patentee as applicant does not disclose such a method in his application."

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On April 23, 1925, the patentees filed another amendment.

On April 27, 1925, the Examiner allowed the divided claim, but finally rejected claim 1 and claims 3 and 4 of the two DeForest claims.

From this action an appeal was taken to the Examiners in Chief.

Under the rule of the Patent Office no question of patentability or invention could be considered in connection with the DeForest claims, because those claims were taken from an issued

3576 patent and the Examiners did not find a clear anticipation.

Having decided that the patentees could make the DeForest claims, the Examiners under the rule rendered a perfunctory decision as to the patentability of the other appealed claim which was more limited by specifying the separate development step, and said:

> "The Examiner allowed these claims, which is evidence of their patentability, notwithstanding that the Greensfelder patent

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was prior art, and which shows the printing of the two positives side by side, Fig. 5, as does also the Craig patent as above set forth. Greensfelder does not photograph his negative simultaneously. While the disclosure in these patents may tend toward a possibility of doubt as to invention being involved in the process defined by claim 1, the grant of the patent to DeForest and the lack of clear anticipation in either of the references or in their combination as to the addition or substitution of features in one not shown in the other and involving the question of invention vs. mechanical skill, we are of the opinion that claim 1 should be allowed in the absence of more pertinent and anticipatory art and appellants allowed to be placed in interference with DeForest to determine the question of priority."

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The interference was decided on the merits in favor of the patentees by the Examiner of Interferences and also by the Board of Appeals, and an appeal was then taken to the Court of Customs and Patent Appeals, in which last named court, on the argument, counsel for DeForest in effect conceded priority to the patentees, and the decision of the Board of Appeals was affirmed.

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I have not considered the arguments or briefs on the interference, as I am not satisfied that they are admissible.

The intereference with the DeForest claims should not have been allowed. Those claims were for a different process than that disclosed by the

3580 *Opinion, Campbell, D. J.*

patentees. This appears to me to have been conceded by plaintiff's counsel in his opening statement on this trial.

Those claims could never have dominated the patent in suit, for if so broadly construed they would not have been sustained over the Craig patent, No. 1,260,337, as the claims themselves read on the Craig patent, if the limitation to the additional rephotographing step is not given its intended meaning.

3581 What DeForest taught and the meaning of the claims clearly appears from the specification of his patent, and that was, instead of printing his sound and picture records directly onto a positive film, as in the patent in suit, DeForest introduced the separate and distinct additional step, namely, a photographing or rephotographing of the sound record onto the original picture negative to obtain "a more exact and faithful photograph containing any details of the finest light variations produced by sound waves". DeForest preferred to make the original sound

3582 record larger in size than could be accommodated with the pictures on the positive film, and to reduce its size by the additional photographing step.

Except for the interference which was sought on behalf of the patentees and was not forced on them by DeForest, I am convinced that the patent in suit would not have been granted with the claims in suit, and it is worthy of note that the only claims in suit which state that the two records are printed on the same side or face of the film, a point on which plaintiff lays great stress, are claims 7, 8 and 9.

By the amendment of July 15, 1931, the al-

leged invention of the patent in suit was broadened to eliminate the separate development step, the most important part of the original disclosure, and to disclose the different two-step process of exposing and printing.

Claims 8 and 9 as I have hereinbefore pointed out are invalid, as they are for a different alleged invention than the original. *Motion Picture Patents Co.* v. *Independent M. P. Co.,* 200 Fed. 411.

The only other two-step claims in suit, 6 and 7, were by the Disclaimer limited to the third step of separate development. 3584

Further, the two-step claims in suit and the broadening amendments were not inserted until July 15, 1931, and that was long after the process had gone into public use, and such an attempt should be regarded by the Courts with disfavor. *Railway Co.* v. *Sayles,* 97 U. S. 554, 563.

Plaintiff contends that it made a two-step claim as early as July, 1925, which was when it found the DeForest patent, but even then it was new matter and was not accompanied by the broadening amendments to the specification inserted July 15, 1931. 3585

The alleged invention of the claims in suit is a process and not an article or product.

A process consists of certain steps or operations in which the invention, if any, must reside. *Cochrane* v. *Deener,* 94 U. S. 780; *Walker,* 6th Edition, Sec. 19.

The patent in suit is entitled, "Process for Producing Combined Sound and Picture Films". It is merely an example of composite or combination printing, a term applied to the making on a single piece of photographic sensitive material

3586 *Opinion, Campbell, D. J.*

prints or impressions from two or more separate negatives, which is very old.

No photographic operation is involved which was not employed in the old art of composite printing which involved both simultaneous and consecutive exposure of separate negatives, separate development of those negatives in an appropriate manner and with different lengths of development, and both simultaneous and consecutive printing of the separate negatives on a
3587 single positive film; and was used in both black and white and color photography, and in both still and motion pictures, long before any date important here.

The patentees made no contribution to the art of photography.

Before 1900, sound was recorded photographically.

Photographic recording of sound with motion pictures and producing a combined sound and picture film, the same as the film in use today, is described in Haines British patent No. 18,057,
3588 of 1906.

The composite printing process of the patent in suit for sound pictures was adopted as the need arose and was used by Craig as early as 1913.

The Craig patent No. 1,260,337 discloses simultaneous recording of sound and pictures on separate films, which are developed separately and printed consecutively on the same positive film, and also shows in Fig. 8 a plurality of sound records printed side by side on the same side of his positive film.

I disagree with plaintiff and agree with defendant's expert Jones, that the Craig patent was operative.

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The Craig patent as I view it, although this is now disputed by plaintiff, anticipates any invention in the process defined in the claims in suit. It is true that Craig printed his sound record on the opposite rather than on the same side of the single positive film, but printing sound and picture records on the same side of the film was well known in the art at that time, and Craig's specification shows that he contemplated printing the sound record on the same side of the film as the pictures, as he says therein:

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> "It will be noted from what has gone before that so far the negative of the sound record and the negative of the picture record have been made upon separate strips or films. It is necessary, therefore, that these two negatives should be photographically printed upon one film or upon opposite sides thereof."

Even if the patent was silent on that point, the patentees cannot base their monopoly upon the printing of the sound and picture negatives on the same side of the film, which was old and well known and was not even mentioned in the patentees' original specification.

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What the patentees were concerned with was the separate development then required for different portions of the picture negative.

The Greensfelder patent No. 1,254,684 disclosed, as I understand it, although this is now denied by the plaintiff, everything in the claims in suit but simultaneous recording.

It cannot be distinguished on the ground that it teaches nothing regarding the recording of

3592 *Opinion, Campbell, D. J.*

acoustic vibrations. It discloses photographing of the sound in the sense of photographically producing a sound record, and a picture record, each on separate films, and then printing both on different portions of the same film.

Simultaneous recording of pictures and sounds was obvious and universal practice, and was disclosed in the Craig patent No. 1,260,337.

Separate development was old and well known in the art, and Craig and Greensfelder separate-
3593 ly recorded records would of necessity be separately developed.

Again I disagree with the plaintiff, as it seems to me that the Bullis patent No. 1,335,651 disclosed everything in the claims in suit but printing the simultaneous and separately developed negatives on a single homogeneous film. His apparent preference was for producing his single positive film, by first printing from his negatives, and then joining them together.

This, however, does not seem to me to be sufficient to relieve the claims in suit from anticipa-
3594 tion, as it was old in the art to print on the same film simultaneously and separately developed negatives.

No reason has been shown nor have I found any why it is impossible for the Bullis patent and the Craig patent No. 1,260,337 to be combined together to anticipate the claims in suit; therefore, I disagree with plaintiff's contention that they cannot be so combined together.

The Bullis construction is not impractical.

The Bullis patent was cited by the Examiner early in the prosecution of the patent in suit and, as it seems to me, resulted in the cancellation of the original claims.

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From that time on, however, it was undoubtedly lost sight of, and was not called to the attention of the Eaminers in Chief, and while as plaintiff contends it may have been in the file, yet no reference was made to it by them, and as I consider it a most pertinent reference, it seems to me that the failure to cite it against the claims as finally allowed deprives the patent in suit of the presumption of validity over the prior art.

Walker patent No. 1,186,717, which is for a combined camera and recorder, was not cited in the Patent Office in the prosecution of the patent in suit, but was a pertinent reference. It discloses the consecutive printing of sound and pictures on the same side of a single positive film of standard width, and I agree with the expert Jones, there "is no functional difference between printing consecutively the picture record and the sound record on the single positive film, as disclosed in this Walker patent, and printing consecutively the separate sound and picture records on a single positive film as disclosed in the patent in suit".

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Walker's film is of standard width; the patentees' film is non-standard.

Walker's film, I believe, could be produced by using the separate negatives of Craig and Bullis, in Walker's printer.

It was everyday practice in the motion picture industry, as early as 1908, to print on standard positive film composite pictures from separately developed negatives.

See testimony of Monnenbacher, and Messter patent No. 1,286,383; British patent to Rossi, No. 21,467 A. D. 1902; and British patent to Downing, No. 6,727 A. D. 1913.

3598 *Opinion, Campbell, D. J.*

Each of these patentees made their records on separate films, developed them separately, and printed a plurality of records on the same side of the positive of a moving picture film. The process of the patent in suit is not changed from the process of those patents, as it matters not whether the records printed on the same side of the film be sound and pictures, or a plurality of pictures, as the process steps are identical. *Brown* v. *Piper,* 91 U. S. 37; *Penn Railroad* v. *Locomotive Truck Co.,* 110 U. S. 490; *Dreyfus* v. *Searle,* 124 U. S. 60.

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It seems clear to me that in combining the old elements of the claims in suit there was no invention by the patentees, but merely a judicious selection from the prior art. *Newcomb* v. *McMahon,* 59 Fed. (2d) 899.

It is not necessary that all of the elements of an alleged invention be found in one patent. *Zimmerman* v. *Advance Machinery Co.,* 232 Fed. 866, 869, 870; *Dilg* v. *George Borgfeldt & Co.,* 189 Fed. 588, 590; *Keene* v. *New Idea Spreader Co.,* 231 Fed. 701, 708; *Linville* v. *Milberger,* 34 Fed. (2d) 386, 388; *Reflectolyte Co.* v. *Luminous Co.,* 20 Fed. (2d) 607, 611.

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The question is not whether the claims in suit are anticipated by any one patent, but whether there is any invention over the prior art, and I am unable to find any such invention.

The three following described patents relate to sound pictures *per se.*

British patent to Pederson, No. 115,942 A. D. 1918, discloses the recording simultaneously of sound and pictures photographically on a single film. After suitable treatment, the sound negative is separately impressed on the single posi-

tive film by embossing, which is a printing operation but not photographic printing, on which the pictures are printed from the original negative.

Kinderman British patent No. 18,163, of 1913, discloses the attaching to the picture negative of a separate wax-coated strip on which he recorded his sound, simultaneously with his pictures, by means of a stylus.

Reimer German patent No. 279,598, of 1914, discloses the recording of sound and pictures simultaneously on separate bands, the picture negative being separately developed, and the sound record separately treated by the well known galvanic process. A copy of the sound record is then made and attached to the separately printed picture positive, forming a single combined sound and picture film. 3602

As to the disclaimer filed herein, after plaintiff had been furnished with a statement showing that both of defendant's films receive the same character of development, it seems to me to be for a purpose that the statute was never designed to permit. *Fruehauf Co.* v. *Highway Co.*, 54 Fed. (2d) 691. 3603

Even with the Disclaimer, claims 6 and 7 show no invention over the prior art.

The claims in suit show no invention over the prior art.

Plaintiff recites at length what it contends are the advantages of the alleged invention, but it seems to me that it does not point to any advantage which does not apply to the prior art which I have considered, and some of the advantages recited by plaintiff are not mentioned in the patent in suit.

3604 *Opinion, Campbell, D. J.*

The cases cited by plaintiff to show validity do not seem to me to be in point.

No commercial success is shown by the plaintiff, and the patentees made no real contribution to the art. The success of the defendant, its licensor and its licensees is due to the many inventions of the Western Electric Company, without which success would have been impossible.

The claims in suit of the patent in suit are invalid by reason of anticipation and lack of in-
3605 vention over the prior art.

The patent in suit is further attacked as invalid under Section 4887 of the Revised Statutes, Title 35, Sec. 32, U. S. Code, so much of which as is necessary for consideration herein providing as follows:

> "No person otherwise entitled thereto shall be debarred from receiving a patent for his invention or discovery, nor shall any patent be declared invalid by reason of its having been first patented or caused to be patented
3606 by the inventor or his legal representatives or assigns in a foreign country, unless the application for said foreign patent was filed more than twelve months, in cases within the provisions of section forty-eight hundred and eighty-six of the Revised Statutes, and four months in cases of designs, prior to the filing of the application in this country, in which case no patent shall be granted in this country."

Patentees' French patent No. 532,750 was granted November 21, 1921, on an application filed March 25, 1921. This application was filed more than one year before March 29, 1922, the

filing date in this country of the patent in suit. The French patent was granted long before the patent in suit.

The prosecution of the application filed in this country April 4, 1921, was abandoned by the applicant.

It seems clear to me, although it is sharply contested by plaintiff, that the French patent is for the same alleged invention as the patent in suit, as it discloses simultaneous recording of sound and picture records on separate films, 3608
which by reason of being separate are necessarily separately developed, and printing of the separate negatives on the same positive film.

While it is true that what is known as "scoring", in which the sound is recorded after the pictures are taken and while they are being projected, is also disclosed in the French patent, that does not change my opinion hereinbefore stated, that the patent in suit is for the same alleged invention, and that is the question to be determined. *General Electric Co.* v. *Alexander*, 280 Fed. 852, 854.

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Plaintiff's contention that this defendant failed to prove what invention was patented under the laws of France, in the said French patent, is not sustained.

The French patent is in evidence and speaks for itself, and both describes and claims the alleged invention of the patent in suit.

The courts in dealing with this statute have always looked to the claims of the foreign patents and read them in the light of the disclosure and decided what is patented, the same as they do with the domestic patents. *Merrell-Soule Co.* v. *Powdered Milk Co.*, 222 Fed. 911, 913; *Sirocco*

3610 *Opinion, Campbell, D. J.*

Co. v. *Sturtevant Co.*, 220 Fed. 137, 143; *Commercial Acetylene Co.* v. *Searchlight Gas Co.*, 188 Fed. 85; *Siemens* v. *Sellers*, 123 U. S. 276, 282; *Leeds & Catlin* v. *Victor Co.*, 213 U. S. 301, 321; *Fireball Gas Co.* v. *Commercial Acetylene Co.*, 239 U. S. 156, 165.

See also *Western Electric Co.* v. *Citizens' Tel. Co.*, 106 Fed. 215, at page 217, where it is expressly stated that the laws of the foreign countries were not proved, but the Court held that
3611 the foreign patent, an Italian patent having no formal claims, was for the same invention.

The French patent undoubtedly claims the process of claims 6, 8 and 9 of the patent in suit, and I can find no support for plaintiff's contention that the French claims do not touch upon separate development which is specified in claims 5, 7 (by Disclaimer) and 11 in suit.

Separately recorded records are described and expressly claimed in the French patent, and the evidence clearly shows that separately recorded records are necessarily separately developed.

3612 Plaintiff's attempt to distinguish between claims 7 and 9 of the patent in suit and the French claims, on the alleged grounds that the latter do not touch upon the matter of consecutive printing, and that the French claims do not state that the films are separate at the time of development (as stated in Disclaimer, Amendment 6) utterly fails.

Neither is a matter of substance nor constitutes the essence of the alleged invention.

That the films are separate at the time of development is obvious, and claim 5 of the French patent clearly states that the two records are copied on the same film, and it is of no moment

whether both records are printed at once, or one after the other.

What is required to constitute identity of a patent within the purview of Section 4887 is substantial not formal identity of invention, as covered by the claims. *United Shoe Machinery Co.* v. *Duplessis Co.,* 148 Fed. 31, 34, 35.

The abandonment of the application based on the French patent, which was for the same alleged invention as that of the patent in suit, made it impossible for the patentees to obtain a 3614
United States patent on an application, filed more than one year after the French application, for the alleged invention of that patent. *Robert Esnault-Pelterie* v. *Chance Vought Corporation,* C. C. A., Second Circuit, July 17, 1933.

The patent in suit is invalid under Section 4887, R. S., Title 35, Sec. 32, U. S. Code, unless plaintiff can maintain its contention that the application for the patent in suit is a continuing application, and entitled to the dates of the abandoned application.

In order to accord to the patent in suit the 3615
date of the abandoned application, intent to continue the earlier abandoned application by means of the application for the patent in suit must be shown.

On the face of the application for the patent in suit, it was entirely independent of and hostile to the abandoned application, and nowhere in the prosecution of the application for the patent in suit is there any suggestion of the intent to continue.

Further, it seems to me that in the prosecution of the application for the patent in suit, the intent to continue was not merely absent, but that the evidence shows an intent not to continue.

3616 *Opinion, Campbell, D. J.*

As late as April, 1931, in the brief filed on behalf of the patentees in the interference with DeForest, it was stated that the earliest date to which they could carry back the date of application for the patent in suit was "limited to April 14, 1921", the date of the German application corresponding to the patent in suit.

The preliminary statement of patentees in said interference states:

3617 "The invention was introduced into the United States by the application papers, viz., the present application Ser. No. 547,860, which papers were received in the United States on or about the 24th day of March, 1922."

It contains no reference to the application for the French patent on which plaintiff now seeks to rely, or to any other foreign application corresponding to the abandoned United States application.

3618 The oath to the application for the patent in suit contains no reference to the application for the said French patent or other corresponding foreign application, as required by the rules of the Patent Office.

On January 26, 1925, the Examiner rejected the patentees' claims on the patentees' own British application, No. 157,751, corresponding to the abandoned United States application and the said French patent.

No attempt was made by the patentees to carry back their date to that of the abandoned application, but they contended that the British complete specification was not accepted and the application had become void, and that although a

publication, it was not available as a reference, as it was not a printed publication more than two years prior to the then pending application.

No mention was made of the French application which had enured into a patent some years before.

It seems clearly established that the patentees did not intend to continue the abandoned application but to prosecute the application for the patent in suit as an independent and hostile application. *American Casting Mach. Co.* v. *Pittsburgh Coal Washer Co.*, 237 Fed. 590. 3620

That the Scott's abandoned application described in the case last cited was a joint application does not change the situation, as a joint application could while pending have been amended to make it a sole application or a new joint application filed while preserving the benefit of the date of the original application. *Union Switch & Signal Co.* v. *Kodel*, 55 Fed. (2d) 173; *In re Roberts*, 263 Fed. 646; *Bijur* v. *Kennington*, 278 Fed. 313; and *Briggs* v. *Kaisling*, 288 Fed. 254.

The following cases cited by plaintiff are not in point, as in each case a clear intention to continue was expressed while the application was pending. *Smith* v. *Goodyear Co.*, 93 U. S. 486; *Corrington V. Westinghouse*, 178 Fed. 711; *Novadel Corp.* v. *J. P. Meyer & Co.*, 35 Fed. (2d) 697. 3621

Plaintiff is debarred from claiming, as it did for the first time on the final hearing of this suit, that the application for the patent in suit is a continuing application, and entitled to the date of its abandoned application.

The patent is invalid.

A decree may be entered in favor of the defendant against the plaintiff dismissing the bill of complaint on the merits, with costs.

3622 *Final Decree.*

Settle decree on notice.

Submit proposed findings of fact and conclusions of law in accordance with this opinion for the assistance of the Court, as provided by Rule 70½ of the Equity Rules and Rule 11 of the Equity Rules of this Court.

MARCUS B. CAMPBELL,
U. S. D. J.

3623 **Final Decree.**

(Filed Oct. 11, 1933.)

At a Stated Term of the District Court of the United States for the Eastern District of New York, held in the United States Court House in the Borough of Brooklyn, City of New York, on the 11th day of October, 1933.

Present:

3624 Hon. MARCUS B. CAMPBELL,
United States District Judge.

AMERICAN TRI-ERGON CORPORATION, Plaintiff, vs. PARAMOUNT PUBLIX CORPORATION, Defendant.	In Equity No. 5800. U. S. Letters Patent No. 1,825,598.

This cause having come on to be heard at this term and having been argued by counsel, and

counsel having stipulated that the opinion of the Court filed herein August 14, 1933, be accepted as a sufficient statement of findings of fact and conclusions of law in this case, under Equity Rule 70½ and Rule 11 of the Equity Rules of this Court, thereupon, upon consideration thereof, it is ORDERED, ADJUDGED AND DECREED as follows, viz.:

1. That claims 5 to 9 inclusive and claim 11, and each of them, of United States Letters Patent No. 1,825,598, to Vogt, Massolle and Engl, assigned to American Tri-Ergon Corporation, for "Process for Producing Combined Sound and Picture Films" are invalid. 3626

2. That the bill of complaint herein be, and the same hereby is dismissed with costs to the defendant to be taxed.

MARCUS B. CAMPBELL,
United States District Judge.

Dated, October 11, 1933. 3627

Approved as to Form:

S. MORTIMER WARD, JR.,
Counsel for Plaintiff.

3628 **Stipulation as to Findings of Fact and Conclusions of Law.**

(Filed Oct. 11, 1933.)

UNITED STATES DISTRICT COURT,

EASTERN DISTRICT OF NEW YORK.

AMERICAN TRI-ERGON CORPORATION, Plaintiff, vs. PARAMOUNT PUBLIX CORPORATION, Defendant.	In Equity No. 5800.

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IT IS HEREBY STIPULATED AND AGREED, by and between the parties hereto, that the opinion of the Honorable Marcus B. Campbell, filed herein August 14, 1933, be accepted as a sufficient statement of findings of fact and conclusions of law in this case, under Equity Rule 70½ and Rule 11 of the Equity Rules of this Court.

3630

Dated, October 11, 1933.

S. MORTIMER WARD, JR.,
Counsel for Plaintiff.

CHARLES NEAVE,
Counsel for Defendant.

3631

Petition for Appeal.

(Filed Dec. 21, 1933.)

UNITED STATES DISTRICT COURT,

EASTERN DISTRICT OF NEW YORK.

AMERICAN TRI-ERGON CORPORATION, Plaintiff, vs. PARAMOUNT PUBLIX CORPORATION, Defendant.	In Equity No. 5800.

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The above named plaintiff, feeling itself aggrieved by the final decree made and entered in the above-entitled cause on or about the 11th day of October, 1933, hereby does appeal from said final decree to the United States Circuit Court of Appeals for the Second Circuit, for the reasons set forth in the assignment of errors filed herewith and it prays that its appeal be allowed and that citation be issued as provided by law, directed to the above-named defendant, commanding it to appear before the United States Circuit Court of Appeals for the Second Circuit, to do and receive what may pertain to justice to be done in the premises, and that a transcript of the record, proceedings and documents upon which said decree was based, duly authenticated, be sent to the United States Circuit Court of Appeals for the Second Circuit.

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Dated, New York, N. Y., December 18th, 1933.

WARD, CROSBY & NEAL,
Solicitors for Plaintiff.

3634 *Order Allowing Appeal and Supersedeas.*

Service of a copy of the foregoing Petition for Appeal is acknowledged this 21st day of December, 1933.

HENRY R. ASHTON,
Solicitor for Defendant.

Order Allowing Appeal and Supersedeas.

3635 At a Stated Term of the District Court of the United States for the Eastern District of New York, held in the United States Court House in the Borough of Brooklyn, City of New York, on the 21st day of December, 1933.

Present:

Hon. MARCUS B. CAMPBELL,
United States District Judge.

3636

AMERICAN TRI-ERGON CORPORATION, Plaintiff, vs. PARAMOUNT PUBLIX CORPORATION, Defendant.	In Equity No. 5800.

The plaintiff having presented its petition for appeal herein, it is ORDERED:

1. That the plaintiff's appeal is allowed as prayed for.

Stipulation as to Bond, etc. 3637

2. That all proceedings herein be stayed, saving those connected with the appeal herein, pending the final determination of said appeal, or the further order of this Court.

3. That the annexed stipulation by and between attorneys for the respective parties waiving the filing of a bond for security for costs on appeal to the Circuit Court of Appeals, is approved.

MARCUS B. CAMPBELL,
U. S. D. J. 3638

Stipulation as to Bond, etc.

UNITED STATES DISTRICT COURT,

EASTERN DISTRICT OF NEW YORK.

AMERICAN TRI-ERGON CORPORATION, Plaintiff, vs. PARAMOUNT PUBLIX CORPORATION, Defendant.	In Equity No. 5800.

3639

IT IS STIPULATED AND AGREED by and between the attorneys for the respective parties that all proceedings herein be stayed, saving those connected with the appeal herein, pending the final determination of said appeal, or the further order of this Court, and that the filing of a bond

3640 *Assignment of Errors.*

for security for costs on appeal to the Circuit Court of Appeals in the above-entitled suit is hereby waived.

New York, N. Y., December 18th, 1933.

WARD, CROSBY & NEAL,
Attorneys for Plaintiff.

HENRY R. ASHTON,
Attorney for Defendant.

3641

Assignment of Errors.

(Filed Dec. 21st, 1933.)

UNITED STATES DISTRICT COURT,

EASTERN DISTRICT OF NEW YORK.

3642

AMERICAN TRI-ERGON CORPORATION, Plaintiff, vs. PARAMOUNT PUBLIX CORPORATION, Defendant.	In Equity No. 5800.

Now comes the plaintiff in the above-entitled cause and files the following assignment of errors on which it will rely upon its prosecution of the appeal in the above-entitled cause from the decree made by this Honorable Court and

made and entered on or about the 11th day of October, 1933:

1. The Court erred in dismissing the bill of complaint.

2. The Court erred in holding Vogt, Massolle and Engl Patent No. 1,825,598 in suit to be invalid, and invalid in respect to the subject matter of claims 5 to 9, inclusive, and claim 11 herein in issue.

3644

3. The Court erred in holding that the said claims in suit are invalid because anticipated by the prior art.

4. The Court erred in holding that the said claims in suit are valid because they lack invention over the prior art.

5. The Court erred in holding that the patent in suit was invalid under Section 4887 of the Revised Statutes, Title 35, Sec. 32, U. S. Code, by reason of the patentees' French Patent No. 532,- 3645
750, granted November 21, 1921, on an application filed March 25, 1921.

6. The Court erred in not entering a decree holding claims 5 to 9 inclusive and claim 11 of the patent in suit to be valid and infringed by the defendant.

7. The Court erred in not entering a decree for an injunction restraining the defendant from infringement of said patent.

8. The Court erred in not entering a decree awarding plaintiff an accounting for profits and

3646 *Note as to Citation.*

damages by reason of infringement by the defendant of said patent.

9. The Court erred in awarding costs to defendant and in not awarding costs to plaintiff.

WHEREFORE, and for divers other errors in the record of this cause appearing, plaintiff-appellant prays that the decree entered herein on the 11th day of October, 1933, be reversed and a decree be directed to be entered holding the pat-
3647 ent in suit valid and infringed by defendant and granting the relief prayed for in the bill of complaint and awarding the plaintiff costs in the United States District Court and in the United States Circuit Court of Appeals, and for such other and further relief as to the Court may seem right.

AMERICAN TRI-ERGON CORPORATION,
By WARD, CROSBY & NEAL,
Solicitors for Plaintiff.

3648 Service of a copy of the foregoing Assignment of Errors is acknowledged this 21st day of December, 1933.

HENRY R. ASHTON,
Solicitor for Defendant.

Note as to Citation.

Citation was duly issued and served on December 22, 1933.

Stipulation and Order as to Certain Exhibits. 3649

IN THE UNITED STATES CIRCUIT COURT OF APPEALS,

FOR THE SECOND CIRCUIT.

AMERICAN TRI-ERGON CORPORATION,
Plaintiff-Appellant,

vs.

PARAMOUNT PUBLIX CORPORATION,
Defendant-Appellee.

No. 3650

IT IS HEREBY STIPULATED by and between solicitors for the respective parties that the printing of the following listed exhibits may be dispensed with on appeal of this case:

Plaintiff's Exhibits 7 to 11 incl., comprising voluminous title papers relative to the patent in suit.

Plaintiff's Exhibits 12a, 17, 18, 19, 20, 21 and Defendant's Exhibits A, C, D, E, K, 3651 comprising film and photographic exhibits.

Defendant's Exhibit I, comprising record and briefs, and opinion re an interference before United States Court of Customs and Patent Appeals. Three copies of this exhibit will be presented at the hearing of the appeal.

New York, N. Y., December 30th, 1933.

WARD, CROSBY & NEAL,
Solicitors for Plaintiff-Appellant.

HENRY R. ASHTON,
Solicitor for Defendant-Appellee.

3652 *Stipulated Praecipe.*

So Ordered:

MANTON,
United States Circuit Judge.

January 4th, 1934.

Stipulated Praecipe.

UNITED STATES DISTRICT COURT,

3653 EASTERN DISTRICT OF NEW YORK.

AMERICAN TRI-ERGON CORPORATION, Plaintiff, vs. PARAMOUNT PUBLIX CORPORATION, Defendant.	In Equity No. 5800.

3654 It is hereby stipulated and agreed by and between the solicitors for the respective parties that the transcript of the record on appeal in the above named cause shall include therein the following, this stipulation being considered as a formal praecipe:

1. Bill of complaint filed November 19, 1931.
2. Answer filed January 26, 1932, and orders amending Answer dated November 18, 1932 and November 23, 1932.
3. Condensed statement of the evidence shown by stenographer's minutes with corrections and omissions as agreed upon by counsel.

4. Opinion of District Court filed August 14, 1933.
5. Stipulation filed October 11, 1933, that said opinion be accepted as sufficient statement of findings of fact and conclusions of law.
6. Final decree of District Court, entered October 11, 1933.
7. Petition for appeal, filed December 21, 1933; Order allowing appeal and supersedeas entered December 21, 1933, and stipulation re latter including waiver of bond, dated December 18, 1933. 3656
8. Assignment of errors.
9. The following statement: "Citation was duly issued and served on December 22, 1933".
10. The following plaintiff's exhibits: 1, 2, 3, 4, 4a, 6, 13, 14, 15, 16, 22, 23, 24, 25, 27, 28, 28a to h, incl., 29, 30, 31, 32, 33, 34, 35, 36, 37, 38.
11. The following defendant's exhibits: B, F, G, H, J, L, M, N, O, P, Q, Q-1, R, S.
12. Stipulation and order authorizing certain exhibits to be treated as physical exhibits. 3657
13. This stipulated praecipe.
14. Stipulation and order as to correctness of record.
15. Clerk's certificate.

It is further stipulated that the remaining exhibits offered in evidence by both parties are to be identified in the record, produced at the hearing in the Court of Appeals and treated as physical exhibits, and that any of the exhibits offered in evidence by both parties may be referred to

3658 *Stipulated Praecipe.*

and used on the hearing in the Court of Appeals as though they were physical exhibits.

Dated, December 29th, 1933.

WARD, CROSBY & NEAL,
Solicitors for Plaintiff.

HENRY R. ASHTON,
Solicitor for Defendant.

3659 Filed Dec. 29, 1933.

3660

3661

Stipulation.

UNITED STATES DISTRICT COURT,

EASTERN DISTRICT OF NEW YORK.

AMERICAN TRI-ERGON CORPORATION, Plaintiff, vs. PARAMOUNT PUBLIX CORPORATION, Defendant.	In Equity No. 5800.

3662

IT IS STIPULATED AND AGREED by and between counsel for the parties hereto that counsel may refer in briefs and argument before the Court of Appeals to any motions and statements made by counsel for either party at the trial, and the Court's rulings thereon, and also to the original transcript of the testimony.

WARD, CROSBY & NEAL,
Solicitors for Plaintiff.

3663

HENRY R. ASHTON,
Solicitor for Defendant.

3664 **Order Extending Time.**

UNITED STATES DISTRICT COURT,

EASTERN DISTRICT OF NEW YORK.

AMERICAN TRI-ERGON CORPORATION, Plaintiff, vs. PARAMOUNT PUBLIX CORPORATION, Defendant.	In Equity No. 5800.

3665

Upon consent of counsel, it is ORDERED that the time within which the record on appeal herein must be filed in the office of the Clerk of the United States Circuit Court of Appeals for the Second Circuit be and the same hereby is extended to and including the 21st day of February, 1934, and the time for all other acts, returns, and appearances in connection with said appeal taken as aforesaid, is likewise extended.

3666 Dated Brooklyn, N. Y., January 19th, 1934.

MARCUS B. CAMPBELL,
United States Judge.

Consented to:
WARD, CROSBY & NEAL,
Solicitors for Plaintiff.

HENRY R. ASHTON,
Solicitor for Defendant.

Stipulation. 3667

UNITED STATES DISTRICT COURT,

EASTERN DISTRICT OF NEW YORK.

AMERICAN TRI-ERGON CORPORATION, Plaintiff-Appellant, vs. PARAMOUNT PUBLIX CORPORATION, Defendant-Appellee.	In Equity No. 5800.

3668

It is hereby stipulated and agreed that the foregoing (in 3 vols.) is a true copy of the transcript of the record of the said District Court in the above-entitled matter as agreed on by the parties.

Dated, February 20th, 1934.

WARD, CROSBY & NEAL,
Solicitors for Plaintiff.

HENRY R. ASHTON,
Solicitor for Defendant. 3669

On reading the foregoing consent of the solicitors for the respective parties herein, it is ordered that the foregoing printed record be filed in lieu of the original papers for the purpose of certifying a record on appeal.

Dated, February 26th, 1934.

MARCUS B. CAMPBELL,
U. S. D. J.

3670

Clerk's Certificate.

UNITED STATES OF AMERICA, }
Eastern District of New York, } ss.:

AMERICAN TRI-ERGON CORPORATION, Plaintiff-Appellant, vs. PARAMOUNT PUBLIX CORPORATION, Defendant-Appellee.	In Equity No. 5800.

3671

I, PERCY G. B. GILKES, Clerk of the District Court of the United States of America for the Eastern District of New York, do hereby certify that the foregoing (in 3 vols.) is a correct copy of the transcript of the printed record in the above-entitled matter as agreed on by the parties and ordered filed by the court.

3672

In testimony whereof, I have caused the seal of the said Court to be hereunto affixed, at the City of New York, in the Eastern District of New York, this 26th day of February, in the year of our Lord one thousand nine hundred and thirty-four, and of the Independence of the said United States the one hundred and fifty-eighth.

PERCY G. B. GILKES,
Clerk.

(Seal)

[fol. 1225] UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT

AMERICAN TRI-ERGON CORPORATION, Plaintiff-Appellant,

against

PARAMOUNT PUBLIX CORPORATION, Defendant-Appellee

Before Manton, Swan and Chase, Circuit Judges

Appeal from the District Court for the Eastern District of New York. Suit for infringement of patent; decree for defendant; plaintiff appeals. Reversed.

Ward, Crosby & Neal, Esqs., Solicitor for Appellant. Theodore S. Kenyon, Esq., S. Mortimer Ward, Jr., Esq., Page S. Haselton, Esq., of Counsel.

Charles Neave, Esq., Henry R. Ashton, Esq., William J. Barnes, Esq., F. T. Woodward, Esq., E. J. Driscoll, Esq., Counsel for Appellee.

MANTON, Circuit Judge:

This suit is for infringement of patent No. 1,825,598, a process for producing combined sound and picture films. It is called sound on film. The application for the patent was filed March 29, 1922, and granted September 29, 1931, after a long interference proceeding with DeForest patent No. 1,489,314 which was finally decided by the Court of Customs and Patent Appeals in appellant's favor. Prompt [fol. 1226] prosecution for this infringement followed.

Appellee is a producer of talking motion pictures and practices this process of producing sound on film motion pictures as taught by the patent in suit. The Western Electric Co., and its wholly owned subsidiary, Electric Research Products, Inc., licensed its licensees, including the appellee, to use the process as the "Western Electric Sound System".

A German application for the same process was filed April 14, 1921.

The problem sought to be solved by the patent was bringing together on one positive film the picture record, which requires one type of development, and a sound record which requires a different type of development. Its accomplish-

ment marked an important advance in the art. Makers of talking motion pictures, including the Western Electric Co. and its associates, during the period following the application for this patent tried, but until the invention exhibited this process, accomplished little with the development of sound on film. While all apparatus necessary to practice the present invention was at hand and owned by the Western Electric Co. and its affiliates, no one solved the film problem presented by the requirement of different treatment for sound and picture records. The difference in treatment was necessary to avoid distortions of one or the other or both in reproduction. The engineers of the Western Electric Co., in this period, struggling for the solution of the problem of sound on film development, turned to sound on disc. The first successful talking motion picture in this country was produced by sound on disc. The process of the patent in suit was brought to this country from [fol. 1277] Germany. Western Electric Co.'s engineers examined and tested it. They thereupon used it and it superseded sound on disc. Its adoption has become universal and speaks for the merit of the inventive thought therein involved. No sound on film was made as this record discloses until the appellant's process appeared. Prior patents proposed using sound on film in connection with motion pictures. One was the single film system which involved recording sound and pictures simultaneously on the same negative film, developing that film as a unit, and then printing the sound and picture records from the single negative film onto a single positive film. This involved no separate development of the sound and picture sequences on a negative film, and was unacceptable for talking pictures of good quality. Pictures require one type of development while sound requires another. No single developing treatment is appropriate to both. Simultaneous development in a single developer produces poor pictures or poor sound or both. The resulting inferior product has relegated the system to uses where sound is not of importance. The other system, the double film system, records sound and pictures simultaneously on separate films. Here the picture negative is developed and printed on one positive film and the sound negative is separately developed and separately printed on another positive film. This system in practice requires two separate projectors, one for the picture positive and the other for the sound positive.

This necessitates the use and synchronization of a double set of projectors, which makes it impractical to commercialize the double film system. Prior patents suggested employing a double film system and endeavored to bind the two separate films on a single projector. But this was [fol. 1228] cumbersome and impracticable. The double film system did not permit the use of a single or unitary positive print and failed to solve the problem.

By the invention in suit, a product of a single positive film bearing the sound and picture records side by side is produced. The new process permits both the sound record and the picture record on the positive film to be as perfect as the arts of photography and telephony can make them and neither is compromised in quality by reason of the presence of the other, as was the case in single film systems. The result is accomplished by recording the sound and pictures on separate films; then separately developing the sound and picture films in separate developer solutions under development conditions appropriate to the requirements of each. A single positive print is made from these two separately developed negatives, by printing the sound and picture sequences side by side on the same face of the positive film. While it might be said that superficially the positives so produced are similar to the positives produced by the single film system, still the function and effect is different and in the practical art that difference has been demonstrated. Combining steps of the double film system and steps of the single film system, the inventors have made a combination, and a process for achieving a new result which has been effective and enduring and has become the standard practice in the industry.

The practical importance and achievement of the invention lies in its product—a one piece positive film having side by side in fixed synchronism on one face picture sequences and sound sequences, each having been recorded simultaneously on separate negatives and developed separately according to its own requirements.

[fol. 1229] The claims sued upon are 5, 6, 7, 8, 9 and 11. Claims 6 and 7 are to be read with the disclaimer filed. Claim 5 is typical and reads:

"5. A process for producing a combined sound and picture positive film, for talking moving pictures, comprising, photographing a sequence of pictures on one length of

film, and simultaneously photographing on another length of film a corresponding sequence of sounds accompanying the action, separately developing the two negatives in a manner appropriate for each, and printing the sound and picture negatives respectively upon different longitudinally extending portions of the same sensitized film, to form the sound sequence at one side of and along the picture sequence."

The commercial use of the patented process is fullsome testimony of its inventive worth. The result of testing it by the inquiry, as it should be, of what has been the commercial success of the invention rather than the appellant's commercial success, adds greatly to its validity.

In addition to the German patent for the same process, a British application for the same process was filed April 11, 1922. It was identical with the United States and German application. The British application resulted in a patent as did the German. The Western Electric Co. scientist, Dr. Wente, applied for a patent disclosing and claiming the invention of the patent in suit. The application stated that for correct sound reproduction

"it is important that the development of the positive and negative be so carried out that the transmission of the positive is at every point proportional to the exposure of [fol. 1230] the negative. This is in general not the best condition for the pictures as under these circumstances they will usually be too harsh. In the system here proposed the picture negative and positive can be developed to give the most pleasing results for pictures, and yet the negative of the sound record can be so developed that when it is printed on the picture positive film the required contrast is obtained in the positive sound record."

His claim No. 31 was rejected on the patent of these inventors' (British Patent No. 178,442) corresponding to the patent in suit and was cancelled. And after that experience, it is now argued, by the Western Electric Co. which is defending this suit, that there is no validity. That Company is hardly in a position to question validity of the patent. DuBois v. Kirk, 158 U. S. 58; General Knit Fabric Co. v. Steber Machine Co., 194 Fed. 99 (C. C. A. 2); Sugar Apparatus v. Yaryan, 43 Fed. 140, 144.

The patents of the prior art to which reference is made, are fairly stated to be but paper patents and they do not anticipate. Composite printing of photographs is illustrated in the Bendman patent No. 125,522 and Jenkins patent No. 606,993. An apparatus for printing motion picture films with pictures arranged alternately in two adjacent series is shown in Dyer No. 970,614. The Haines British patent of 1906, No. 18,057, is an example of single film system. It is clear, however, from the description, that both the picture series and the sound track were to be recorded on the same negative film. The Rossi British patent of 1909, No. 21,467, had the idea of saving expense in positive [fol. 1231] prints by printing the picture series from one picture negative on one half of the positive print and another picture series of another picture negative on the other half of the positive print along side the first series. The inventor made no suggestion of the combination of the two systems, nor does he disclose any process whereby the single positive film may be produced with sound and picture sequences after separate development of each appropriate to their respective requirements. Craig No. 1,260,337; Bullis No. 1,335,651 and Greensfelder No. 1,254,684 were before the patent office and there held not to be anticipations. Craig did not show or describe anywhere a sound and picture record on a single film where the sound and picture records did not overlie each other. In the process he was attempting to operate, he wanted to print on opposite sides. The experts agree that this is wholly inoperative. His patent was owned by a well known corporation—the Eastman Kodak Co.—with resources for investigation and practical uses, but apparently it was found of little value. Greensfelder proposed carrying out his purpose by providing a space for different sound marks adjacent to each film of the picture sequence. The location of the sound mark in the space controlled the noise to be produced. Each location was to be connected by a separate selenium cell and train of mechanism, with the noise machine corresponding to that location. Thus, if a sound mark were recorded on the extreme left of the space it might effect the beat of a drum; if it were in a different location it might blow a whistle. The invention in suit has a photographic picture of sound waves on the sound track. [fol. 1232] Greensfelder had only an arbitrary arrange-

ment of sound marks each identical with the other and differing only in its location in the space reserved for the sound marks. Greensfelder takes his picture negative, develops and prints it first before trying to make sound marks at all. The latter are to be on a separate film after the picture positive has been completed and reproduced as a silent movie. In no event does the development of Greensfelder's sound mark negative present any problem like that in the independent development of the sound and picture negatives. Greensfelder does not provide for separate development of picture and sound negatives. He has no sound negatives, and as a practical matter the patent is addressed to a method to escape from problems of photographic recording of the natural sounds accompanying the action. It does not deal with the "talkies" problem. The Walker patent No. 1,186,717 was limited to an old single film system; the sound and pictures were to be taken simultaneously on a single negative developed together and printed together. There is no disclosure of the separate development of the sound and picture negatives in the manner appropriate for each, and their subsequent printing on the same positive film. All the disadvantages that are inherent in the single film system with its identical development of both the sound and picture sequences, are present in Walker's disclosure, and he makes no suggestion which would aid in avoiding them. Other patents of the prior art are far afield from any anticipation of the patent in suit.

A defense of abandonment is interposed under Revised Statutes § 4920. It must be affirmatively pleaded in the [fol. 1233] answer, and this was not done. The claim of abandonment imposes a heavy burden upon one asserting it.

On April 14, 1922, the examiner rejected the claims citing Bullis patent No. 1,335,651. On November 25, 1922, the applicants cancelled their original claims from the United States application and inserted a single claim addressed to the divisible negative film feature which was the subject matter of original claim 3. On December 7, 1922 the corresponding British patent issued with but a single claim identical with the divisible film claim then standing in the United States application. On September 29, 1924 before any use of the invention in this country,

claims corresponding in scope to claims 5, 6, 7 and 11 were asserted in the United States application. After March 31, 1925, claims corresponding in scope to claims 8 and 9 in suit were asserted in the application. There were no intervening rights of any sort established by the appellee or by the public in the interval between November 25, 1922 and March 31, 1925, nor was there any unreasonable delay on the part of the applicants in reasserting their invention in the broad scope justified by the original disclosure. Throughout the entire period, the applicants were asserting the invention in its broad scope in their German application and patent. That application was never restricted to the divided film system but was maintained in language broad enough to cover either the separate film system of the claims in suit or the divided film system illustrated in the United States patent. If the applicants to any degree acquiesced in the limitations in the British patent, the evidence is ample of their insistence on the invention in its broad scope in the German application. It is a common [fol. 1234] practice to vary the scope of the claims during the course of a patent application. To temporarily cancel the broad claims and later reassert them is permissible. In the absence of intervening rights such claims are entirely proper. There is no requirement that the applicant shall in all cases from the date of application to the date of issue assert claims as broad in scope as those ultimately allowed. Wirebounds Patents Co. et al. v. Saranac Automatic Machine Corp., 37 Fed. (2) 880 (C. C. A. 6); Auto Pneumatic Action Co. v. Kindler & Collins, 247 Fed. 323 (C. C. A. 2). This defense may not be sustained.

The interference between the application in suit and DeForest Patent No. 1,489,314 was won by the patentees in the tribunals of the Patent Office and the Court of Customs & Patent Appeals. The DeForest invention was subsequent to the invention of the patent in this suit.

The appellee argues that the patent in suit is invalid under the provisions of Revised Statutes § 4887 because of the issuance of a French patent No. 532,750, twelve months before filing the application of the patent in suit. To constitute invalidity of the present patent by the French application, it must be shown that the inventions actually claimed in that foreign country and those of the patent in suit are identical. It is not enough to say that the French

patent may disclose the invention of the later United States patent, when it is not therein claimed. Leeds & Catlin v. Victor Talking Machine Co., 213 U. S. 301; General Electric Co. v. Alexander, 280 Fed. 852 (C. C. A. 2). The question becomes one of identity between them. There is no [fol. 1235] such identity here. The French patent is for a photo-phonetic film, namely, an apparatus or product claim, which cannot be identical with or fatal to a process claim. Leeds & Catlin v. Victor Talking Machine Co., supra; Fireball Gas Tank & Illuminating Co. v. Commercial Acetylene Co., 239 U. S. 156. The French patent is essentially a proposal for escaping from the difficulties of recording natural sounds accompanying the action. The significance of the independent recording of concomitant sounds is apparent from the language of the specification. Nowhere in the French claims or specification is there a suggestion of the characteristic feature of separate and independent development of the negatives to compensate for different exposure in recording. The purpose of the French patent was to avoid the photographing of sounds "from sources which are scenic". Here the purpose is just the opposite. The distortions of sound and pictures which apparently had been unavoidable in single film practice and which had made scoring preferable have now been removed. The French patent in no way treats of separate development.

The patentees fully complied with Revised Statutes § 4887 as to the French patent by filing an application substantially identical therewith in the Patent Office of the United States on April 4, 1921, ten days after the filing of the French application. While the application was pending in the United States, they filed a German application for the invention here in suit, and within the allowed period, thereafter filed the United States application for the patent in suit. The two United States applications were thus co-pending, and while the patentees have been insistent and consistent in their position that the inventions covered by [fol. 1236] the successive patents were not the same, still, if the inventions were the same, the first United States patent was filed within the convention period and their second application, being co-pending, is true continuation of the first. Novadel Process Corp. v. J. P. Meyer & Co., 35 Fed. (2) 697 (C. C. A. 2); Victor Talking Machine Co. v. American Graphaphone Corp., 145 Fed. 350 (C. C. A. 2).

The appellees' process infringes the claims in suit. The stipulation provides that the appellee's process for producing a combined sound and picture positive film for talking motion pictures comprises recording photographically a sequence of pictures on one length of film and simultaneously recording photographically a series of sounds accompanying the scenes on a separate film. The picture negative and sound negative are developed separately and in different developers. The choice of developers and the time of development being such as to give the desired result. The picture and sound negatives thus separately made and separately developed are printed successively in properly spaced relation on the same surface of a positive film. In this manner a single positive film carrying the sound sequences and picture sequences is produced. There is no material difference between the purpose for which the appellee uses the process and that described in the patent. In any case, the appellee uses the process of the patent and achieves the results intended by the patentees. The patent is valid and infringed.

Decree reversed.

Swan, J., dissenting.

[fol. 1237] UNITED STATES CIRCUIT COURT OF APPEALS,
SECOND CIRCUIT

At a stated term of the United States Circuit Court of Appeals, in and for the Second Circuit, held at the courtrooms in the Post Office building in the City of New York, on the 11th day of June, one thousand nine hundred and thirty-four.

Present: Hon. Martin T. Manton, Hon. Thomas W. Swan, Hon. Harrie B. Chase, Circuit Judges.

AMERICAN TRI-ERGON CORPORATION, Plaintiff-Appellant,

vs.

PARAMOUNT PUBLIX CORPORATION, Defendant-Appellee.

Appeal from the District Court of the United States for the Eastern District of New York.

This cause came on to be heard on the transcript of record from the District Court of the United States for the

Eastern District of New York, and was argued by counsel.

On consideration whereof, it is now hereby ordered, adjudged, and decreed that the decree of said District Court be and it hereby is reversed with costs.

It is further ordered that a Mandate issue to the said District Court in accordance with this decree.

Wm. Parkin, Clerk.

[fol. 1238] [Endorsed:] United States Circuit Court of Appeals, Second Circuit. American Tri-ergon Corporation vs. Paramount Publix Corporation. Order for Mandate. United States Circuit Court of Appeals, Second Circuit. Filed Jun. 11, 1934. William Parkin, Clerk.

United States Circuit Court of Appeals

FOR THE SECOND CIRCUIT.

No. 496.

AMERICAN TRI-ERGON CORPORATION,

Plaintiff-Appellant,

vs.

PARAMOUNT PUBLIX CORPORATION,

Defendant-Appellee.

PETITION FOR REHEARING BY DEFENDANT-APPELLEE

[illegible]

[illegible]

Defendant-Appellee.

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United States Circuit Court of Appeals

FOR THE SECOND CIRCUIT.

AMERICAN TRI-ERGON CORPORATION, Plaintiff-Appellant, vs. PARAMOUNT PUBLIX CORPORATION, Defendant-Appellee.	No. 439.

PETITION FOR REHEARING BY DEFENDANT-APPELLEE.

On behalf of the defendant-appellee, Paramount Publix Corporation, we respectfully petition for a rehearing, being most sincerely convinced that the decision of this Court, if permitted to stand, will result in a great injustice to the entire motion picture industry of this country and will place a heavy burden on that industry which has no reasonable relation to anything that the patentees did.

The opinion of the experienced District Judge, who heard the testimony, was as much in defendant's favor as the opinion of the majority of this Court is in favor of the plaintiff. We firmly believe that had this Court been privileged to see and hear the witnesses, it would have reached the same conclusion as the lower court. It was possible for the plaintiff to color and draw inferences from the facts in briefs and argument

in this Court in a manner and to an extent not possible in the trial court, with the result that this Court was clearly misled. It is quite possible that the trial judge might have committed error on some of the numerous branches of the case, but it is unlikely that he should have been so completely wrong as this Court has held.

We believe that a brief review of the pertinent facts, even without argument, would raise sufficient doubt in the minds of the majority of this Court to make the Court wish to reconsider the case, particularly in view of the far reaching importance of the case to the entire motion picture industry.

We recognize that with the large amount of work this Court has to do, the Court can seldom permit cases to be reargued, and especially is this true just before the summer recess. Nevertheless, we feel that the great importance of this case, not merely to the parties who are before the Court, but to the whole industry, should induce the Court to grant our request.

Should it not be possible to reargue the case before the summer recess, we respectfully suggest that it be heard as soon as the Court reconvenes in the fall. This would not result in substantial delay because a petition for writ of certiorari, even if filed now, would not be disposed of by the Supreme Court until sometime in October at the earliest. The Court's attention is also called to the fact that Judge Campbell's decision was made on August 14, 1933 and that the plaintiff failed to take an appeal until December 18, 1933, or over four months. Had the appeal been promptly taken, it would have been heard by this Court much earlier in the year and the Court would not have been called upon to consider a petition for rehearing just prior to adjournment.

We desire to reargue three points, as follows:

1. The patented process had nothing whatsoever to do with the successful commercialization of sound-on-film talking pictures.

2. There was no patentable invention in the process.

3. The Patent Office proceedings and the De Forest interference do not create but, rather, rebut any presumption of validity of the claims.

1. The Patented Process Had Nothing Whatsoever to do With the Successful Commercialization of Sound-on-Film Talking Pictures.

The opinion states (pp. 2, 3):

> "Makers of talking motion pictures, including the Western Electric Co. and its associates, during the period following the application for this patent tried, but until appellant exhibited this process, accomplished little with the development of sound on film. While all apparatus necessary to practice the present invention was at hand and owned by the Western Electric Co. and its affiliates, no one solved the film problem presented by the requirement of different treatment for sound and picture records. The difference in treatment was necessary to avoid distortions of one or the other or both in reproduction. The engineers of the Western Electric Co., in this period, struggling for the solution of the problem of sound on film development, turned to sound on disc. The first successful talking motion picture in this country was produced by sound on disc. The process of the patent in

> suit was brought to this country from Germany. Western Electric Co.'s engineers examined and tested it. They thereupon used it and it superseded sound on disc. Its adoption has become universal and speaks for the merit of the inventive thought therein involved. No sound on film was made as this record discloses until the appellant's process appeared."

As we shall show by direct references to the record, the following findings, in the above quotation, are contrary to the record:

1. That the Western Electric Co. and its associates accomplished little with the development of sound-on-film until the appellant exhibited the process of the patent in suit.

2. That while all apparatus necessary to practice the invention was at hand and owned by the Western Electric Co. and its affiliates, no one solved the film problem presented by the requirement of different treatment for sound and picture records.

3. That the engineers of the Western Electric Company were struggling for the solution of the problem of sound-on-film development, and turned to sound-on-disc.

4. That no sound-on-film was made until the appellant's process appeared.

The only thing we can think of that could have caused the Court to make these findings is that the Court must have believed that the Western Electric Company copied the patented process from the patentees in January, 1927 when the patentees' apparatus was demonstrated at the Fox Film Company here. **If the Court had that impression, the record shows it to be wholly erroneous.**

The patented process was independently disclosed by the Western Electric engineers without any knowledge of the patentees' work, long prior to the 1927 demonstration by the patentees. The process was disclosed by Dr. Wente in his application which was filed on April 8, 1924 (II, 604), over two years and a half before the 1927 demonstration. There is, and could be, no dispute as to this fact. Moreover, the patented process was used by Dr. Wente in 1925, long before he ever heard of the patentees' work. He testified (I, 322, 323):

> "I have described the work of the Western Electric Company that they did on this sound-on-film method and on photographing the sound and the pictures on separate negatives, **and then by 1925 joining them together on the same positive, and on the same side of the same positive.**
>
> "Q. 66. Up to that time or thereafter did you have any knowledge of the work of Vogt and his associates or any of the Tri-Ergon companies anywhere in the world?
>
> "A. **I had no knowledge.**"

Moreover, as Wente also pointed out on cross-examination, (I, 369):

> "x-Q. 281. When was this perfectly obvious? A. **Well, in 1920, at any rate, we had considered the question of having the sound and picture record on a separate film for reproduction or on a single film. As far as the recording was concerned, we at all times felt that we should record separately and we always did so.**
>
> "x-Q. 282. Well, was your statement intended to be one or not, that in your opinion this idea of taking on separate films the sound and picture and then printing them on one common film was perfectly obvious in 1920? A. **Absolutely.**"

Certainly if Wente had thought there was any invention in that idea he would have submitted it

to the patent department in 1920, which he did not do. He said (I, 372):

> "I never supposed at any time, that this general problem of taking separately and printing at the same speed, that there was anything new in that, or I would have submitted it to the patent department."*

And in 1923 Wente recorded sound and pictures on separate films and developed them separately. He testified (I, 358):

> **"When I, in the laboratory, took the sound and pictures on separate films and kept them separate throughout,** the stock which I used for the sound record **at that time, in 1923,** was negative stock, the same as the picture stock.
>
> "As to those sound and picture records when they were taken on separate films and kept on separate films, I do not know whether I personally developed them, but **I saw them being developed, they were developed separately. They would be developed in a different developer. The rea-**

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* No novelty, in that respect, was asserted by Wente in submitting his work to his company's patent department. The latter, in drafting his application, inserted a claim covering the separate development of the negatives and printing on one positive film. *They certainly would not have done that, had they known of the Bullis patent for the separate development.*

This Court held (Opinion, p. 4) that the Western Electric Company, which is defending this suit, is hardly in a position to question validity because of Wente's application, citing *Dubois* vs. *Kirk*, 158 U. S. 58; *General Co.* vs. *Steber Co.*, 194 Fed. 99, decided by this Court, and a Pennsylvania District Court case. We do not believe the Court would have made this holding, had it realized that the *Dubois Case* only holds that under such circumstances the defendant can not deny the *utility* of the alleged invention. *It did not hold that the defendant can not deny validity.* The law on that subject is stated by the Supreme Court in *Haughey* vs. *Lee*, 151 U. S. 282, as follows (p. 285):

> "There is no merit in the proposition made in the second assignment of error, that defendants are estopped from asserting that there is no patentable novelty in plaintiff's invention, by their conduct in seeking to procure, through one of their employés, a patent for substantially the same invention. *Whether or not there is*

> **son why we developed them—there is one reason we couldn't develop them any other way, that is, the facilities that we had was a tray developer. We developed one strip of film in a tray, and we would throw that out and make fresh developer for the other film."**

The Western Electric Company was at no time struggling with or concerned at all about any problem having anything to do with the process of the patent in suit, but was working on very real problems relating to the electrical features of sound recording and reproduction. As Wente testified (I, 355):

> **"We devoted all our attention to the making of and the improving of the record. Whether we were going to have pictures with it, in what manner, whether on the same film or on different film, that was thoroughly evident we had no concern with [it]."**

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any inconsistency in trying, at one time, to get a patent for a supposed invention, and in afterwards alleging, as against a rival successful in obtaining a patent, that there is no novelty in the invention, it certainly cannot be said to constitute an estoppel. Besides, the defence of want of patentable invention in a patent operates not merely to exonerate the defendant, but to relieve the public from an asserted monopoly, and the court cannot be prevented from so declaring by the fact that the defendant had ineffectually sought to secure the monopoly for himself."

We also respectfully call the Court's attention to *Smokador Mfg. Co.* vs. *Tubular Co.*, 27 F. (2d) 948, decided by Judge Thomas in 1928, and the opinion by Judge Putman in the First Circuit Court of Appeals, in *Osgood Co.* vs. *Metropolitan Co.*, 75 Fed. 670, 673, cited by Judge Thomas. *The decision of this Court as to the Wente application is in direct conflict with the decision of the Supreme Court in Haughey* vs. *Lee, supra.* The soundness of the Supreme Court's holding in that case is clearly demonstrated in this case in which the entire motion picture industry would be prejudiced merely because one company filed a patent application for the same alleged invention. Invention cannot be created by estoppel. There could be no true estoppel in any event in this case because the defendant is the Paramount Company. The Wente application was filed by the Western Electric Company. The latter's subsidiary, Electrical Research Products, Inc., is defending the case but it is not a party defendant.

And (I, 359):

> "I have no recollection that we made any sound and picture records in 1924, because **we were working with the sound principally.**"

Also (I, 351):

> **"There were quite a large number of problems that had to be worked on in getting the apparatus for the recording, of the study of film emulsions, quite a lot of work we did for several years there."**

We have reproduced at the back of this petition defendant's Exhibit O, which shows the Western Electric sound-on-film recording system. If the Court may visualize by means of this diagram the enormous amount of work, which was done by the Telephone engineers over a period of years and at great expense, in perfecting the numerous electrical devices entering into this and also the Western Electric reproducing system, and which made possible the success of sound pictures both disc and film, we are sure the Court will not believe that the work of the patentees of the patent in suit contributed anything to that success. The work of the Telephone engineers on the devices shown in the diagram is described by Wente at pages 307 to 320 of Volume I.

This Court said in *Western Electric Company* v. *Wallerstein,* 60 F. (2d) 723, 724, that the success of sound pictures was due solely to high quality reproductions. It was to the attainment of this high quality that the Telephone engineers devoted their attention. They developed to an almost unbelievable degree of perfection and fidelity the vacuum tube amplifiers, microphones, and loud speakers which are vital parts of the Western Electric systems. **The plaintiff itself admitted that the Western Electric amplifiers**

were indispensable (I, 108). And, as Wente testified (I, 378-379):

> "Rd-Q. 319. In your opinion, would sound pictures have been successful commercially without the developments to which you have referred of the Western Electric Company?
>
> "A. No, I think not, unless similar developments had been made somewhere else.
>
> "Rd-Q. 320. Had any such development been made at the time that the Western Electric system was introduced? A. No."

It was the Western Electric apparatus embodying these electrical developments which Electrical Research Products Inc. licensed the defendant in this case to use "as the 'Western Electric sound system'" **and not the process of the patent in suit,** as the Court apparently thought when it said (Opinion, p. 2):

> "The Western Electric Co., and its wholly owned subsidiary, Electric Research Products Inc., licensed its licensees, including the appellee, **to use the process as** the 'Western Electric Sound System' ".

There is nothing in the record to support the Court's statement that the Western Electric Company or its subsidiaries licensed the use of this process by anyone, and the contrary is the fact.

The Western Electric Company did not turn to sound-on-disc because of any problem it had encountered with sound-on-film. The sound-on-disc and sound-on-film developments went along hand in hand in the Bell Laboratories, one being handled by one group of engineers and the other by another group (I, 313). The disc system happened to be the first to be put in use commercially; it had the immediate advantage that it

could be used with the picture films and projection equipment already in use.* This occurred in August, 1926, but, as Drake testified, the Western Electric Company was in a position to manufacture and put out the sound-on-film system the same year (I, 338). **The Fox Film Company acquired its license to use the Western Electric sound-on-film system in December, 1926. The Fox Film Company was not then and is not now connected in any way with the plaintiff.** Plaintiff's President, William Fox, was President of the Fox Film Company in December, 1926, when this Western Electric license was acquired, but is no longer connected with the Fox Film Company.

The commercial introduction of the Western Electric sound-on-film system was not delayed because of any lack of knowledge of the patented process. That had been independently disclosed by Wente in 1924 and practiced by him in 1925. **The sole and only reason that the Western Electric talking motion pictures were not introduced commercially until 1926 was to permit the attainment of the high quality of sound reproduction which is a commonplace today but which was**

* The sound-on-disc form was introduced first commercially because the apparatus was ready for manufacture. The Western Electric electrically recorded disc records for phonographs had already been introduced commercially by the Victor and Columbia Phonograph Companies (I, 313, 314). The sound-on-disc form involved merely the attachment of a phonograph type of turntable to the existing motion picture projectors and no modification of the projectors or film printing machines. It involved no change in the size of the picture on the film and enabled existing films to have sound reproduced with them. The sound-on-film form on the other hand involved new recording equipment and new recording technique with which the motion picture producers were not familiar and also changes in the existing film printing machines. Quite naturally the simplicity of the disc system appealed to the producers as did also the fact that the technique of recording disc records was already in commercial use and well understood.

essential to success. This the patentees wholly lacked and the process of the patent in suit most certainly did not provide.

The patentees made their invention in 1921 but sound pictures did not succeed until 1926 and then only at the hands of the Western Electric Company. If the process of the patent in suit was holding back talking motion pictures, why did not the patentees' system attain commercial success in Germany in 1921 and spread all over the world before 1926, as did the Western Electric system in the very short period following its introduction? If the work of the patentees of the patent in suit was satisfactory, why did not the leading motion picture producers in the United States acquire licenses from the plaintiff instead of from the Western Electric Company? The plaintiff was formed for the express purpose of commercially exploiting the Tri-Ergon "inventions, improvements, and processes" in the United States (Ex. 8, p. 8) but plaintiff's proofs fail to show that it has a single machine in use anywhere or that it has any licensees. The plaintiff has done nothing commercially but has confined its activities to patent exploitation by means of litigation. On the other hand, the record shows that the leading motion picture producers in the United States use the Western Electric recording system and apparatus (I, 332).

The patentees' attempt to introduce their sound-on-film system in Germany prior to 1926 flatly failed and their unsuccessful experiments would never have been heard of again had it not been for the world-wide interest resulting from the Western Electric Company's success, which alone made it possible for the patentees to revive their unsuccessful experiments.

It is not true that no sound-on-film was made until the appellant's process appeared. The patentees not only admitted this but stressed the fact in the De Forest interference. They said (Ex. I, Part 4, p. 43):

> "**It will be understood that the recording of sound on film was a well understood and known accomplishment at the date [1921] of De Forest's conception of the invention at issue. It is disclosed in numerous patents and had actually been accomplished not only by others but by De Forest.**"

Sound was recorded photographically by the Western Electric Company, as early as 1913 (I, 312). And as Wente also testified he recorded sound-on-film talking pictures in 1923 (I, 352).

In the case of *Stanley Co. of Am.* v. *General Talking Pictures Corp.*, 47 F. (2d) 817, which involved a patent applied for (in 1913) nine years before the application for the patent in suit, the Court of Appeals for the Third Circuit held that sound-on-film had long been known. It said (817):

> "**We refer to this in order to now dispel any impression that the patent here involved is the foundation stone, so to speak, of the 'talkie-movie' art.** Now in sound reproduction two types of records have **long been known**, namely, the disc system, which is used in victrola practice, with which we are not here concerned only to say the sound waves are there recorded by a cutting stylus on a wax record and reproduced by contact with a needle. The other **known method**, and with which we are here concerned, is where the sound waves are photographed on a sensitized film from which film record they are reproduced by action thereon of a beam of light."

But even more important, the Court has overlooked the fact that the Fox Film Company, which was the first motion picture producer to become interested in sound-on-film, successfully recorded sound-on-film in its studio in New York in the summer of 1926 and reproduced it commercially in theatres in the fall of 1926, considerably before the patentee, Engl, came to this country. Joy, plaintiff's own technical man, who was formerly with the Fox Film Company, testified (I, 110):

> "This apparatus that was brought from Germany that I have been testifying about was brought in 1926. It arrived in New York the latter part of December, 1926. **And prior to that time the Fox Case Corporation had in this country recorded sound-on-film. That Fox Case Corporation was the sound picture subsidiary of Fox Film.**"

And, (I, 111):

> "The first sound pictures which were recorded in Fox Studios in New York were recorded entirely by Case apparatus. **That was in July, 1926.**"

Engl gave his demonstration here in January, 1927, but the Fox Film Company did not use the process of the patent in suit for some time thereafter. Plaintiff's own witness, Smith, who was in charge of the Fox Film Company's sound-on-film business during this period, repeatedly pointed out that the sound-on-film productions of the Fox Film Company, which were recorded on single film, were responsible for the success of sound-on-film. **Sound-on-film had succeeded here with the aid of the electrical devices provided by the Western Electric Company, before the process of the patent in suit was ever**

adopted commercially. Smith testified (I, 421, 422):

> "When Fox Case started out they had what they called the Movietone wagons, going around to take sound pictures. Those were their equipment for the Fox Movietone News. **The Fox Movietone News was probably the biggest, in my opinion, Fox Movietone News was the biggest single reason for the successful introduction of sound into the motion picture business, because it showed not only that there was a tremendous demand on the part of audiences for sound, they responded tremendously to such a feature, but it showed it was practical to record pictures with sound anywhere anything that could be photographed in silence, and today that has been proved to be the case.**"

And, (I, 423):

> "The first time sound news shots were taken was at West Point in March, 1927. That crew immediately left for Italy, and actually recorded Mussolini in Italy in May, 1927. At the same time, toward the end of May, 1927, one of the great historic events of all time, Lindbergh's flight to Europe, was actually recorded by Fox Case sound-on-film, and the films were thereafter shown. **That was one of the biggest news stories ever photographed, and was one of the reasons for the tremendous interest in sound pictures. To show how feasible sound-on-film pictures were at that time, the Fox Laboratory got their negative in the morning, and in the afternoon we were showing the picture on Broadway.**"

The Fox Film Company did not record its commercial productions on separate films and print them on a single positive film until considerably later. As Smith testified (I, 426):

"Q. 47. Can you state when the Fox Case started using the method of taking the sound and picture records on two separate negatives, and then separately developing them and then printing the sound and picture records on one positive? A. I do not believe Fox Case, as I remember it, **Fox Case did not do that until we went to the coast, Hollywood, where for production purposes, sound and picture recording on two different pieces of film were very much desired.**"

This was in 1928, as Joy testified (I, 112). **Joy also admitted that the Western Electric Company developed its "own standard apparatus"** (I, 113). That apparatus was entirely different from the apparatus demonstrated at the Fox Film Company by the patentee, Engl. What Engl had was a sound recorder and camera combined in one machine. With such a machine the sound is recorded right where the action takes place in the studio. It therefore did not have the advantages provided by the Western Electric system which permits the recording machines to be placed elsewhere in the studio. This is accomplished by the electrical interlock which the Western Electric Company supplied the Fox Film Company in 1928. As Joy said (I, 112):

"The Western Electric Company furnished the Fox Case Company with an electrical interlock as between the picture camera and the sound camera early in 1928."

And, (I, 113):

"x-Q. 63. **The interlock made separate films possible with the sound recorder off the set, did it not?** A. **Yes, that is true. That was an advantage.**"

Smith also testified that the commercial films produced by the Fox Film Company prior to

Engl's demonstration were superior to the Germans' films. He said (I, 432):

> "I can only repeat what I have said before, that in my opinion, at that time, and that time covers a period of several years, **the quality of Fox Case sound was superior to the quality of any other sound on any other system manufactured by anyone else, either sound on film or sound on disc.**"

And (I, 422):

> "About the Tri-Ergon apparatus, the system being brought over by Mr. Joy, Mr. Joy left the United States either the end of July or—I remember distinctly that the Tri-Ergon equipment landed in New York, either in the middle of December, 1926, or toward the close of that month. It was immediately set up first at 10th Avenue and 55th Street studio, which was a very large floor, and I remember a lot of the equipment being scattered all over the floor. And then later, it was brought down and used in competition with or in comparison with the Fox Case equipment in the studio at 10th Avenue and 54th Street.
>
> "I did have occasion to compare the merits of the sound and pictures, the Fox Case sound and pictures with the Tri-Ergon system and the disc sound pictures, that system of Western Electric at that time.
>
> "Q. 34. To what extent did you have occasion to observe it? A. Well, practically to a daily extent. That was my only work for several years.
>
> "Q. 36. And what is your opinion as to the relative merits of the three, as you saw them at that time? A. **I think easily the Fox Movietone or Fox Case which it was was No. 1, as being best in quality.** At that time I would have preferred the Tri-Ergon sound on film to the Western Electric sound on disc."

Plaintiff's own witness thus admitted, while being examined by plaintiff's counsel, that the Fox Movietone pictures, recorded on single film, were superior to anything that the German patentees were able to show in 1927, although the latter employed the process of the patent in suit and had been experimenting since 1918.

And Drake, Vice-President of Electrical Research Products Inc., who also heard the Tri-Ergon apparatus demonstrated, testified (I, 328, 329):

> **"The reproduction was very unsatisfactory; it was not of good quality. He [Engl] had considerable difficulty in making the apparatus function."**

The Fox pictures were recorded and reproduced with the aid of the electrical devices developed by the Western Electric Company, which were responsible for their good quality. The process of the patent in suit was not used. The Fox Film Company acquired its license from the Western Electric Company in December, 1926 (I, 431). The patentee, Engl, brought his machine to the Fox Film Company in 1927, but the Fox Film Company rejected it after determining that it was inferior to the Fox Case and Western Electric system, which the Fox Film Company was then using, continued to use and has used ever since. The fallacy of plaintiff's position thus clearly appears.

The patentees did not advance the art. They did nothing which could possibly justify the far-reaching monopoly which the decision of this Court has given them.

2. There was No Patentable Invention in the Process.

The opinion states (p. 2):

> "The **problem** sought to be solved by the patent was **bringing together** on **one** positive film the picture record, which requires one type of development, and a sound record which requires a different type of development. **Its accomplishment** marked an important advance in the art."

We respectfully submit that no such problem existed. The "bringing together on one positive film" of the picture and sound records was not a problem. The prior Greensfelder patent No. 1,254,684 (II, 701) contains the following statement (p. 3, l. 128-p. 4, l. 8):

> "A developed negative containing the rows of '**sound** marks' but on which the spaces for the pictures are blank, is superimposed upon a developed negative properly pieced and joined and having the **pictures** photographed thereon but having spaces for the 'sound marks' left blank, and **a print is made from this combined negative which will give a positive** containing the pictures 4 and the corresponding rows of 'sound marks' 3, shown in Fig. 3."

The only act or operation involved in the "problem" was printing the two negative films on one positive film. Plaintiff's own counsel admitted at the argument in the lower court that there was no problem in this printing operation. He said (Tr. p. 15):

> **"Well, we never have suggested that we ever invented any idea of printing."**

This being so, what invention could the patentees have made over the prior Bullis patent No. 1,335,651 (II, 714), **which disclosed much more completely than the patent in suit the simultaneous recording and separate development of sound and picture films?** Certainly there was no novelty in the idea of having the sound and pictures on the same positive film.

Bullis preferred to use two final positive films instead of one because this enabled him not only to give separate development treatments to each of the negatives before printing the positives but also to the final positives (II, 719, ll. 78-99). It is not that Bullis overlooked the possibility of printing both negatives on the same film but merely that he preferred to carry out, even as to his final prints, "the special individual handling or treatment necessary to the best results" (II, 719, ll. 78-99). Printing both negatives on one film necessitated a compromise which Bullis did not wish to make. The separate development operation of the process of the patent in suit was disclosed much more completely by Bullis than by the patent in suit.

That there was no patentable novelty in the step of the process which involves printing both negatives on the same film is also brought out by consideration of a further statement in the opinion of the Court, as follows (p. 4):

> "The result is accomplished by recording the sound and pictures on separate films; then separately developing the sound and picture films in separate developer solutions under development conditions appropriate to the requirements of each. A single positive print is made from these two separately developed negatives, by printing the sound and picture sequences side by side **on the same face** of the positive film."

The Court here limits the printing operation to printing on the same face of the positive film. It, then, becomes pertinent to inquire what the patentees taught as to this. We quote below the patentees' application as originally filed:

> "In the production of speaking films it is of great advantage especially from the point of view of use, to arrange the sound sequence and the picture sequence upon one and the same material separate (film).
>
> "In this procedure, however, there frequently occur in consequence of the changing lighting conditions in the cinematographing process, changes in the degree of light and the bromide of silver layer, and this causes the picture sequence to be either overlighted or underlighted."
>
> "As the same film, however, bears close to the picture sequence the continuously normally lighted sound sequence, these differences cannot be removed in the case of combined negatives, by developing, weakening, strengthening and so forth.
>
> "They can only be removed by subjecting the underlighted or the overlighted negative places to separate corresponding treatment.
>
> "Technically, this treatment is practically impossible so long as the two sequences are photographed upon the same film.
>
> "According to the present invention the difficulty is overcome by either employing entirely separate films for the production of the negatives, or films which are connected during the photographing, but which are separated from one another before the developing.
>
> "The synchronism is assured in both cases by the perforations and by corresponding marks. The production of the positive films can take place by copying the two negative films preferably consecutively upon the same positive films.
>
> "One can, however, also unite previously the two negative films longitudinally to-

gether, and then copy this so united negative in the usual manner."

This original disclosure can be searched in vain for any statement whatsoever that the two records are to be printed on the same face of the film, to say nothing of any emphasis upon this as an essential or important part of the supposed invention. Plaintiff's own expert could not find any such statement in the application and resorted to inference and to the prior art when cross-examined about it. Nor is any such statement to be found in the specification of the patent as issued. Plaintiff's witness, Ballard, testified (I, 89):

"x-Q. 207. Do you find in the original specification as filed any statement that the sound and picture records are both printed on the same side or face of the final positive film?

"A. I find that by **inference**, sir.

"x-Q. 208. What do you get the inference from?

"A. From line 79: 'One can, however, previous to the printing, unite longitudinally together the two developed negative films and then copy this so united negative film in the usual manner.' **The usual manner was to print the sound record and picture record on different longitudinally exposed portions of the film.**

"x-Q. 209. **It was usual in the prior art to print them on the same side of the same film?**

"A. **In connection with the single film system, it was.**"

If the "usual manner" in the prior art can be resorted to by the patentees, why cannot that same "usual manner" be used by the defendant?

Not only was this the common practice, but it was also an old and well-known practice to print separate pictures from two separate negatives upon the same side of a common positive (see pp. 25-28, *infra*). So far as the **process** is concerned, it obviously makes no difference whether the negatives are sound records or picture records or any other records.

And in the Greensfelder patent we have a picture negative and a separate negative of **sound** marks, both photographically printed upon the same side of a common positive. Considered as a step in a process, the "problem" of "bringing together" upon the same side of a common positive the records on separate negatives requires no new exercise of inventive ingenuity by reason of what **appears** on the respective negatives. Obviously, it makes no difference whether the negative sound record is a phonographic sound record or any other kind of mark representing sound. If one wished to produce a positive print from two separate negatives, one taken with ordinary light and the other with x-rays, and this had never been done before, the fact that one of the negatives was an x-ray picture would not create a new problem of bringing these negatives together upon a common positive, nor would it require any inventive ingenuity for its solution.

The Walker patent No. 1,186,717 (III, 852) clearly shows how sound can be printed, photographically, alongside of the pictures on the same face of the positive film.

Still this Court has distinguished the Craig patent No. 1,260,337 (III, 861) because "he wanted to print on opposite sides" (Opinion, p. 7). **Is it conceivable that a monopoly so vast that it will demand tribute from every motion picture producer in the United States can be**

upheld on any such distinction, and especially where plaintiff's own expert has admitted there was nothing new or novel about it?

Craig's separate sound and picture negatives were recorded separately, separately developed and then printed on the same positive film (I, 452). **This fully anticipates any patentable novelty in the patentees' process as a process.** As stated in Walker on Patents, 6th Ed. § 19:

> "The generic definition of a process is 'an operation performed by rule to produce a result.' "

The invention, if any, must reside in the steps or operations of the process. The patent in suit disclosed only three operations, namely, recording on separate film, developing separately, and printing on one positive film. The result was a composite print of the two records. Craig performed exactly the same operations and obtained exactly the same result, a composite print of the two records. The fact that Craig's records are on opposite sides of the film does not make them any less a composite print. **The steps in Craig's process are identical with those disclosed in the application for the patent in suit.**

To sustain a process patent, it is not enough that the product produced by the process may be different in some respect from that produced by a former process. **The process itself must possess novelty.** In the leading case of *Brown* v. *Piper,* 91 U. S. 37, the patent in suit was for a process of preserving fish. Referring to a prior patent, the Supreme Court said (p. 41):

> "Here was the application of the requisite degree of cold exactly in the manner called for in the specification of the appellee.

> "This is hardly denied; but it is insisted that the process was never applied by the witness to the preservation of fish and meats.
>
> "The answer is, that this was simply the application by the patentee of an old process to a new subject without any exercise of the inventive faculty, and without the development of any idea which can be deemed new or original in the sense of the patent law. The thing was within the circle of what was well known before, and belonged to the public. **No one could lawfully appropriate it to himself, and exclude others from using it in any usual way for any purpose to which it may be desired to apply it.**"

Clearly any invention that might have existed in the process of the patent in suit was anticipated by Craig. The application for the patent in suit stated only that the negatives should be printed on the same positive film; not that both must be printed on the same face of the positive film.

The opinion states (p. 7):

> "Craig did not show or describe anywhere a sound and picture record on a single film where the sound and picture records did not overlie each other. In the process he was attempting to operate, he wanted to print on opposite sides. The experts agree that this is wholly inoperative."

Defendant's expert, Jones, the chief physicist and head of the Physical Research Laboratory of the Eastman Kodak Company, did not agree that Craig's **printing process** is inoperative, as, of course, it is not. Nor did he agree that Craig's composite print with the records overlying each other would not be useful when properly made. (See I, 178, 269, 270, 271.)

The patentees of the patent in suit disclosed no process invention over either the prior Bullis or Craig patents.

The opinion seems to us to show that the Court approached the patent in suit from the wrong point of view. The **product** of the patented process is used in exhibiting talking motion pictures, but the question of patentability of the **process** must be determined by the state of the art of composite printing. The application for the patent in suit was classified and examined in the Optics and Photographic Division of the Patent Office. Its own title shows conclusively that it was correctly classified. It is entitled, "Process For Producing **Combined** Sound and Picture **Films.**" **The patented process is merely another instance of the old and well known practice of composite printing.**

The authority of the statements of defendant's expert, Jones, on this subject, is of the highest order. Jones is not a professional expert and, as the record shows, he testified in this case because he was directed to do so by the Eastman Kodak Company (I, 241). Jones testified as follows (I, 166, 167):

> "Q. 103. Does the process of the patent in suit involve any photographic operations which are not involved in the ordinary art of composite printing, and if it does involve some additional operations, tell us what they are? A. **It involves nothing other than that known in the art as composite printing.***
>
> "Q. 104. How about in composite printing using and subjecting the two negatives to different lengths of development? Was that done or was it not done? A. **Very common.**

* See the *dictionary* definitions of *1894, 1896, 1906, and 1912* (I, 161-166).

"Q. 105. Did you do that composite printing yourself prior to April, 1921? A. Yes, I have often made prints, printing in clouds into landscapes without the clouds and other types of composite printing. **It was commonly used in pictorial photography.**

"Q. 106. How early did you do that? How far back did you do that work yourself? A. Oh, I imagine about in **1900.**

"Q. 107. And the Eastman Company, did it have any experience, so far as you know, with composite printing prior to April, 1921? A. **Well, of course, the art and practice of composite printing has been so general that the Kodak Company has made materials which have been used for that purpose, in many cases special materials for the practice of combination printing.**

"Q. 108. Now, will you state the steps involved in making composite prints such as you did them prior to 1921, and such as Eastman did them prior to 1921, beginning with the making of the separate records? A. **Well, two or more negatives are exposed, either on the same or different objects. These exposed negative materials are then developed separately in such a way as to give images of the character required for the subsequent operation of making the combination print. These are then printed together on a single piece of photographic material. They may be either adjacent, juxta-posed, or superposed, in register, on the same face or on opposite faces, as the case may be. There are any number of possibilities of combining the negatives in making combination printings."**

And the Biograph Company, in making motion pictures, took two motion pictures, each on separate negative films, developed them separately, and printed them on the same side of one positive film (Nonnenbacker, I, 128-134).

The admissions which the patentees made in the interference with De Forest are binding upon them. They said (Ex. I, Part 4, pp. 2, 3):

> "It will be observed that the invention at issue is **not** one—
>
> "(1) merely for the recording of sound on film, nor
>
> "(2) merely for the recording of pictures on film, nor both on the same film, nor
>
> "(3) **merely for recording sound and pictures on separate films so as to be able to develop them separately and then project them together, nor**
>
> "(4) **merely for printing sound and pictures from separate negatives upon a single film.**
>
> **"Each of these ideas, separately and collectively, was old prior to the conception date of either party, neither of which goes back of 1921. There are issued patents of record describing each of these four ideas, and each was a well recognized part of the art prior to the date of either party to this interference. This cannot be disputed. See for example, Greensfelder No. 1,254,684 (starting p. 3, line 92, and p. 5, lines 13 and 128). See also in addition De Forest's patent No. 1,446,246, filed in 1918, for the recording of sound."**

This is a clear admission by the patentees themselves that all three steps of their separate film process were old in the very same combination. The admission includes under (3) exposing on separate films followed by separate development, and under (4) the printing of the separately developed negatives on a single film.

Clearly, the patentees made no contribution to the photographic art. The three steps of the

patented process were old and well known in the same combination and order utilized by the patentees. No new principle, relationship or operation was involved. To hold under these circumstances that there was invention in the process is clearly contrary to the decision of the Supreme Court in the well-known *High Vacuum Case*, 283 U. S. 664, 678, 679.

Instead of constituting an important advance in the art, as the Court has held, the patent in suit added nothing whatsoever to existing photographic knowledge.

3. The Patent Office Proceedings and the De Forest Interference Did Not Create But, Rather, Rebut any Presumption of Validity of the Claims.

In the opinion, this Court said (p. 1):

> "The application for the patent was filed March 29, 1922 and granted September 29, 1931, after a long interference proceeding with De Forest patent No. 1,489,314, which was finally decided by the Court of Customs and Patent Appeals in appellant's favor."

And, (p. 10):

> "The interference between the application in suit and the De Forest patent No. 1,489,314 was won by the patentees in the tribunals of the Patent Office and the Court of Customs and Patent Appeals. The De Forest patent was subsequent to the patent in this suit."

From this it would seem that the Court considered that the De Forest interference and the decision rendered in it, strengthen or create a presumption of validity of the claims. The con-

trary is the fact. The claims in suit had no real examination in the Patent Office, but were granted under circumstances preventing a consideration of validity.

The De Forest interference was decided in favor of the patentees of the patent in suit by the Court of Customs and Patent Appeals, but the case was not considered by that Court on the merits. As the opinion shows (Ex. I, part 1):

> "At the time of oral argument in this Court, counsel for appellant [De Forest] stated that there were two methods of producing talking moving pictures on the same film, one of which did not comprise photographing simultaneously the picture and the sound upon separate films; that the counts in issue were limited to a method comprising photographing simultaneously the picture and the sound upon separate films; that, as the evidence produced by appellant [De Forest] was not directed precisely to the method of photographing simultaneously the picture and the sound upon separate films, he could not conscientiously ask the Court to consider appellant's evidence as so limited; and that, under the circumstances, he would formally suggest that the decision of the Board of Appeals be affirmed."

The decision of the Board of Appeals was therefore affirmed.

De Forest, thus, **conceded priority** to the patentees of the patent in suit insofar as there was any subject-matter common to the De Forest patent and the application for the patent in suit.

The De Forest interference was not declared until the application for the patent in suit had been pending for several years and had been persistently and consistently rejected by the Patent Office Examiner. The application stood rejected on March 31, 1925 (II, 499), after it had been pending for three years and when the patentees

could have had little hope that it would ever be allowed. They, therefore, dug up the De Forest patent, which had issued nearly a year before, and copied from it the two interference claims which were claims 1 and 3 of the De Forest patent and which ultimtely became claims 3 and 4 of the patent in suit. The patentees made little or no attempt to distinguish the Greensfelder patent, on which their application stood rejected, stating (II, 500, 501):

> "**Further discussion of this reference** [Greensfelder] **seems unnecessary in view of the fact that broader claims than those which have been contained herein are contained in patent No. 1,489,314**, granted to Lee De Forest, on April 8, 1924, for Recording Sound. It appears that claims 1 and 3 of this patent can be made herein, and these claims are added hereto by the present amendment as claims 3 and 4. An interference with the said patent at an early date is requested."

The patentees thus admitted that the De Forest claims were broader than any which they had previously made. The Examiner did not agree with the patentees' casual dismissal of the Greensfelder patent and again rejected the claims on the merits, stating (II, 502):

> "**It is shown to be old in Craig to take separate synchronous sound and picture records simultaneously and to then reproduce these two records on a single record strip. Applicant desires to reprint both records on one side only; but this is the teaching of Greensfelder, note page 3, line 128 to page 4, line 8.**"

The Examiner (Jarboe, the Principal Examiner of the **Optics and Photography Division of the Patent Office**), was the very same examiner who had granted the De Forest patent

(II, 942). **He had allowed the claims to De Forest over the Craig patent only because of his very definite understanding of their limited meaning and he did not propose to have them misconstrued so as to read on the original disclosure of the patent in suit.** He, therefore, ruled that the patentees had no right to make the claims (II, 502).

The De Forest specification (III, 876) also leaves no doubt as to what De Forest understood to be the meaning of the claims. Instead of printing his sound and picture records directly onto a positive film, as in the patent in suit, De Forest introduced the separate and distinct additional step, namely a photographing or re-photographing of the sound record **onto the original picture negative** to obtain "a more exact and faithful photograph containing any details of the finest light variations produced by sound waves" (pat. p. 1, ll. 61-64).

Thus the Examiner, whose regular duty and responsibility it was to pass upon questions of invention in the photographic art, and who had granted the claims to De Forest, ruled unequivocably against any invention in the subject-matter here involved. And he stated in effect that he would not have allowed the interference claims to De Forest in view of the Craig patent had they been intended to cover the subject-matter of the claims in suit. **Certainly, in view of these facts, the force of the Examiner's finding of non-invention is very great. And especially is this so in view of the further fact that in 1913 the Patent Office had refused because of lack of invention to grant claims to Craig for his composite print or process claims like those in suit for printing on the same film.**

Then the plaintiff's attorneys provoked the interference with De Forest and urged that they

had great concern that De Forest claims might later dominate the patent in suit if an interference were not obtained. That was truly fantastic.* The plaintiff's attorneys merely saw the technical advantage which their discovery of the De Forest claims gave them, making it possible for them to eliminate the experienced Examiner who was certain never to allow any claim not limited to the patentees' specific divided film process.

Having failed in getting the Examiner to declare the interference, the patentees' attorneys appealed to the Examiners-in-Chief. The result of their efforts was to raise sufficient doubt in the minds of the Examiners as to the meaning of the De Forest claims to obtain a favorable ruling. By numerous arguments, the attorneys convinced the Examiners that the De Forest patent "may be somewhat vague" (II, 530). In whatever respect the De Forest patent may have been vague, there certainly could have been no reasonable doubt that both De Forest and the Examiner, who allowed the patent, intended and understood the claims to call for the additional photographic step not disclosed by the patentees of the patent in suit.

Under the peculiar rule of the Patent Office practice no question of patentability or invention could be considered in connection with the De Forest claims because those claims were taken from an issued patent (see the patentee's brief, Ex. 3, pp. 62, 63):

> "That this opinion is correct is believed to be confirmed by the decision of the Commis-

* Plaintiff's counsel stated in opening statement to the District Court (Tr. 20, 21) that "I have always had doubts in my mind as to just what those two claims do mean with respect to his [De Forest's] process and ours", and (Tr. 60), "His [De Forest's] idea was totally different from the specific idea or problem that the patentees set up as their illustration of being able to handle these films separately."

sioner of Patents in *Both* vs. *Barr,* 200 O. G. 29:

> 'Where an applicant seeks an interference **with a patent, Held** that the claims in the application should not be rejected unless such rejection is based upon a clear anticipation.'

and *Ex Parte Brinkman* [1914 C. D. 30] cited therein quoting portions of Commissioner Ewing's decision wherein he held:

> 'The question has been raised elsewhere as to the propriety of the refusal by this Office to grant a claim to an applicant which is the same as the claim **of a patent** disclosing **interfering** subject-matter. Without passing on this broad question, it seems to me clear that after a patent has once been granted it is not good practice to reject an applicant seeking an interference, where the rejection is based upon no clear anticipation, but the piecing together of several patents.' ''

Therefore, having decided that the patentees could make the De Forest claims, the Examiners-in-Chief were compelled by this rule to render a purely perfunctory decision as to the patentability of the other appealed claim, that claim being more limited than the De Forest claims by specifying the separate development step. It is most significant, however, that, even under the restraint of the rule, the Examiners-in-Chief expressed doubt as to the patentability of all the claims over Craig and Greensfelder and clearly indicated, it seems to us, that they would have held them unpatentable were the De Forest patent not outstanding. They stated (Ex. 3, pp. 61, 62):

> ''The Examiner allowed these claims [*De Forest's claims*] which is evidence of their patentability notwithstanding that the Greensfelder patent was prior art and which

shows the printing of the two positives side by side, Fig. 5, as does also the Craig patent as above set forth. Greensfelder does not photograph his negatives simultaneously. **While the disclosures in these patents may tend toward a possibility of doubt as to invention being involved in the process defined by claim 1 the grant of the patent to De Forest** and the lack of clear anticipation in either of the references or in their combination as to the addition or substitution of features in one not shown in the other and involving the question of invention vs. mechanical skill, we are of the opinion that claim 1 should be allowed in the absence of more pertinent and anticipatory art **and appellants allowed to be placed in interference with De Forest to determine the question of priority."**

So, the result of the Patent Office proceedings was that doubts were cast on the patentability of the claims, not that they were valid. **If the liberal Patent Office was in doubt as to whether invention was involved, is it not clear that the Court on the present record, in which the prior art is developed much more fully than it was in the Patent Office, should conclude that invention was not involved?**

Respectfully submitted,

CHARLES NEAVE,
HENRY R. ASHTON,
Counsel for Defendant-Appellee.

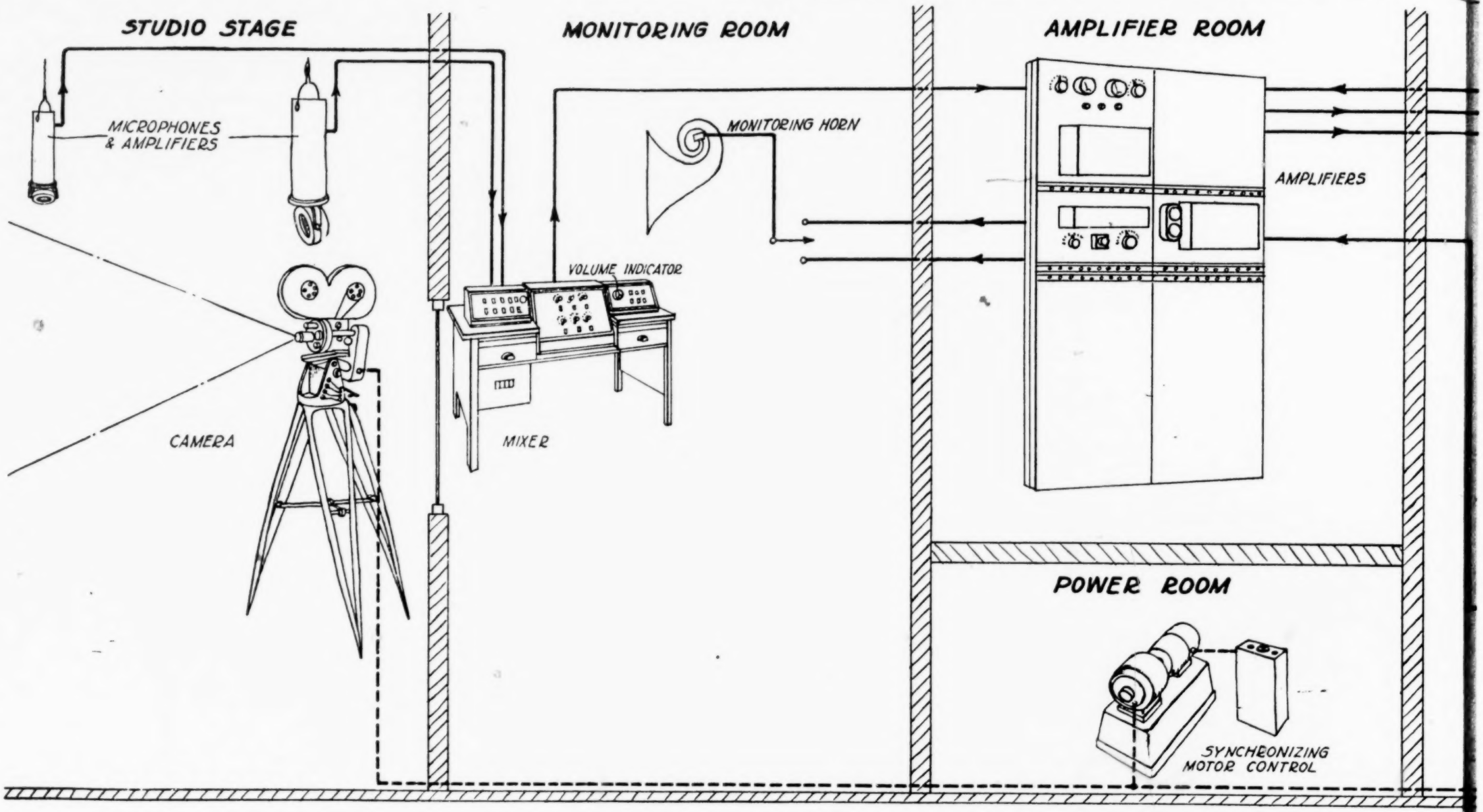
Certificate.

We certify that this petition for rehearing, in our opinion, is well founded in law and in fact, and that it is not filed for the purposes of delay.

CHARLES NEAVE,
HENRY R. ASHTON,
Counsel for Defendant-Appellee.

June, 1934.

WESTERN ELECTRIC RECORDING SYSTEM



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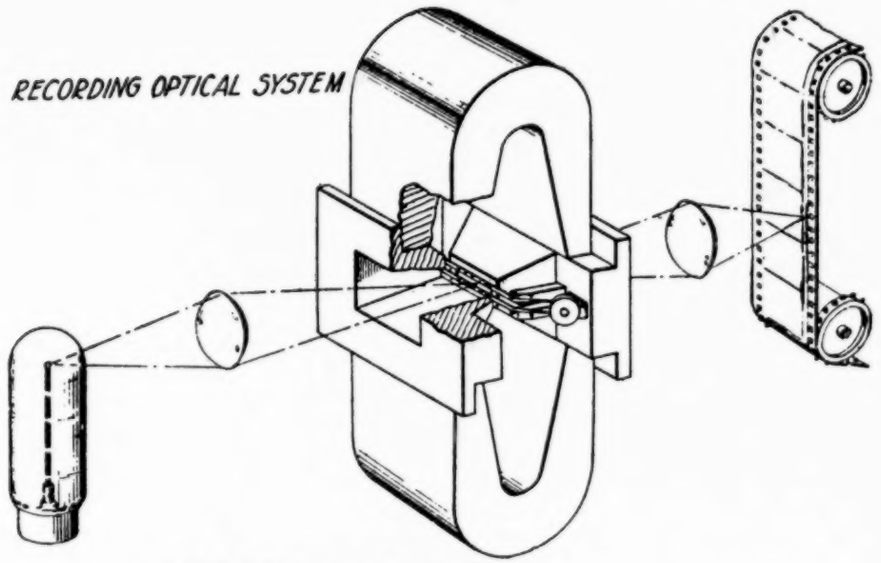

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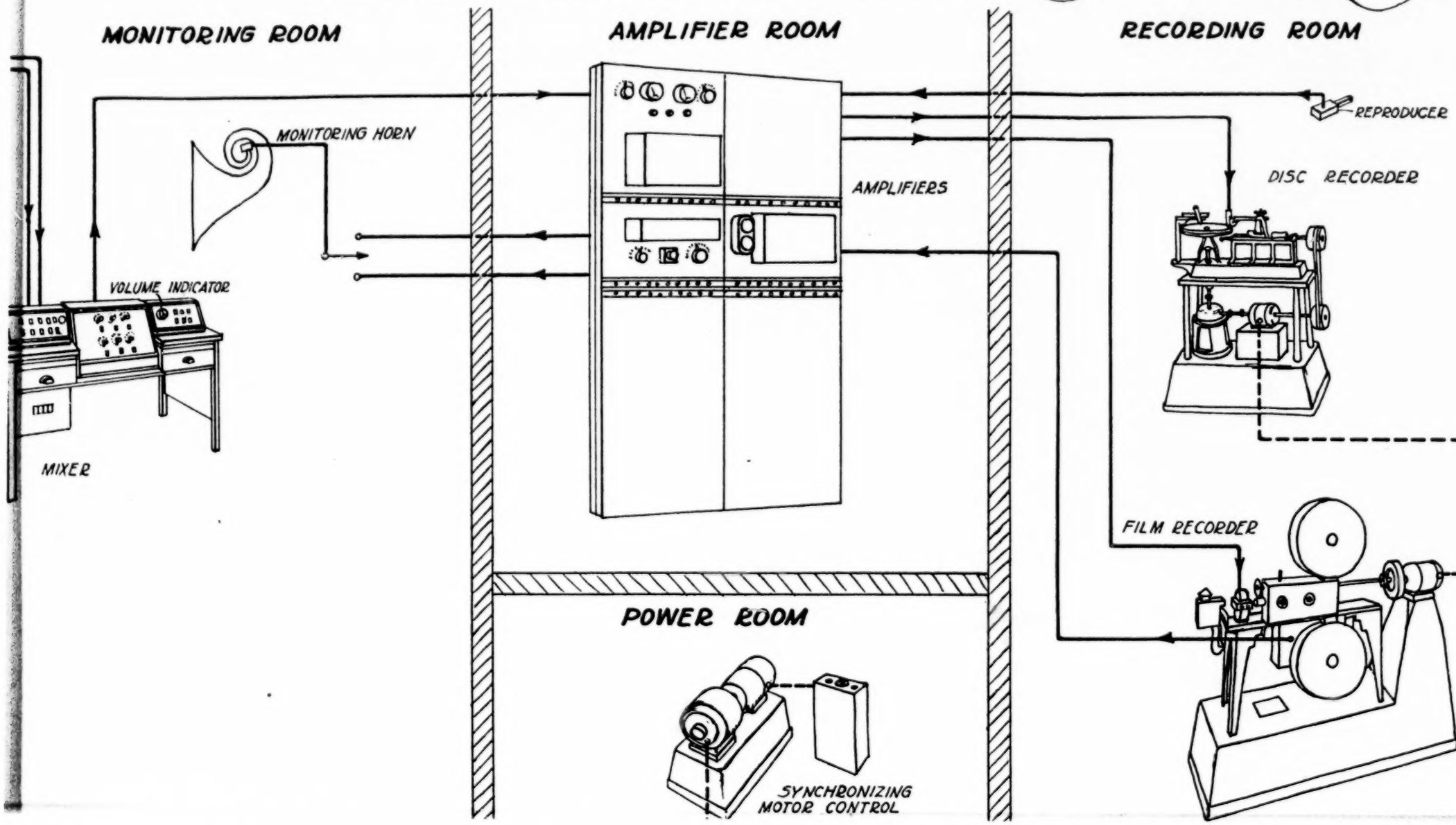

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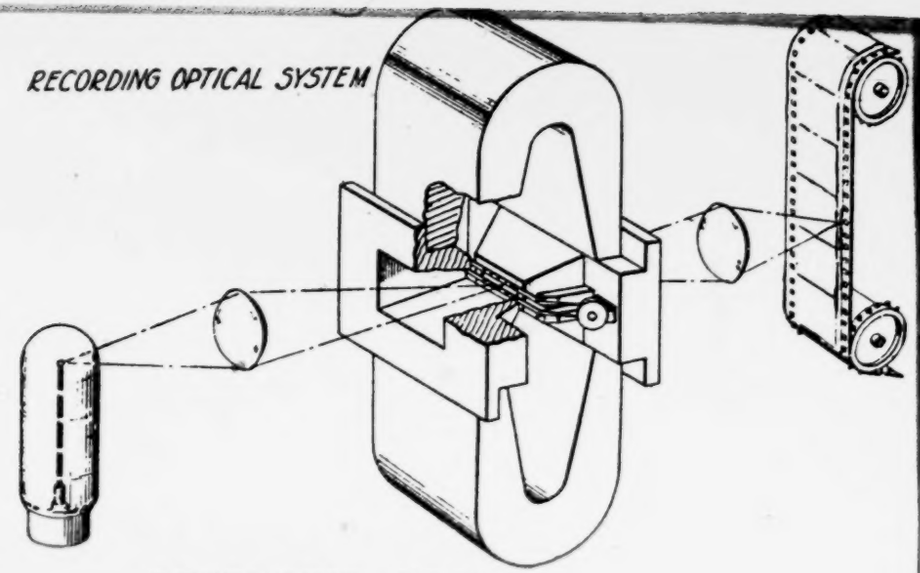

MONITORING ROOM

AMPLIFIER ROOM

RECORDING ROOM

MONITORING HORN

VOLUME INDICATOR

MIXER

AMPLIFIERS

REPRODUCER

DISC RECORDER

FILM RECORDER

POWER ROOM

SYNCHRONIZING MOTOR CONTROL

[fol. 1274] UNITED STATES CIRCUIT COURT OF APPEALS,
SECOND CIRCUIT

At a stated term of the United States Circuit Court of Appeals, in and for the Second Circuit, held at the court-rooms in the Post Office building in the City of New York, on the 2nd day of July, one thousand nine hundred and thirty-four.

Present: Hon. Martin T. Manton, Hon. Thomas W. Swan, Hon. Harrie B. Chase, Circuit Judges.

AMERICAN TRI-ERGON CORPORATION, Plaintiff-Appellant,

vs.

PARAMOUNT PUBLIX CORPORATION, Defendant-Appellee.

A petition for a rehearing having been filed herein by counsel for the appellee;

Upon consideration thereof it is ordered that said petition be, and hereby is denied.

Wm. Parkin, Clerk.

[fol. 1275] [Endorsed:] United States Circuit Court of Appeals, Second Circuit. American Tri-ergon Corporation vs. Paramount Publix Corporation. Order. United States Circuit Court of Appeals, Second Circuit. Filed Jul. 2, 1934. William Parkin, Clerk.

[fol. 1276] UNITED STATES OF AMERICA,
Southern District of New York:

I, William Parkin, Clerk of the United States Circuit Court of Appeals for the Second Circuit, do hereby certify that the foregoing pages, numbered from 1 to 1275, inclusive in 3 volumes, contain a true and complete transcript of the record and proceedings had in said Court, in the case of American Tri-ergon Corporation, Plaintiff-Appellant, against Paramount Publix Corporation, Defendant-Appellee, as the same remain of record and on file in my office.

In testimony whereof, I have caused the seal of the said Court to be hereunto affixed, at the City of New York, in the Southern District of New York, in the Second Circuit, this 5th day of July, in the year of our Lord one thousand nine hundred and thirty-four, and of the Independence of the said United States the one hundred and fifty-ninth.

Wm. Parkin, Clerk. (Seal United States Circuit Court of Appeals, Second Circuit.)

(5184-C)

SUPREME COURT OF THE UNITED STATES

ORDER ALLOWING CERTIORARI—Filed November 5, 1934

The petition herein for a writ of certiorari to the United States Circuit Court of Appeals for the Second Circuit is granted. And it is further ordered that the duly certified copy of the transcript of the proceedings below which accompanied the petition shall be treated as though filed in response to such writ.